



COLOR LASERJET ENTERPRISE CM4540

MFP SERIES

Service Manual





HP Color LaserJet Enterprise CM4540 MFP Series

Service Manual

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Conventions used in this guide

 **TIP:** Tips provide helpful hints or shortcuts.

 **NOTE:** Notes provide important information to explain a concept or to complete a task.

 **CAUTION:** Cautions indicate procedures that you should follow to avoid losing data or damaging the product.


 **WARNING!** Warnings alert you to specific procedures that you should follow to avoid personal injury, catastrophic loss of data, or extensive damage to the product.

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1 Theory of operation

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- [3-bin stapling mailbox](#)

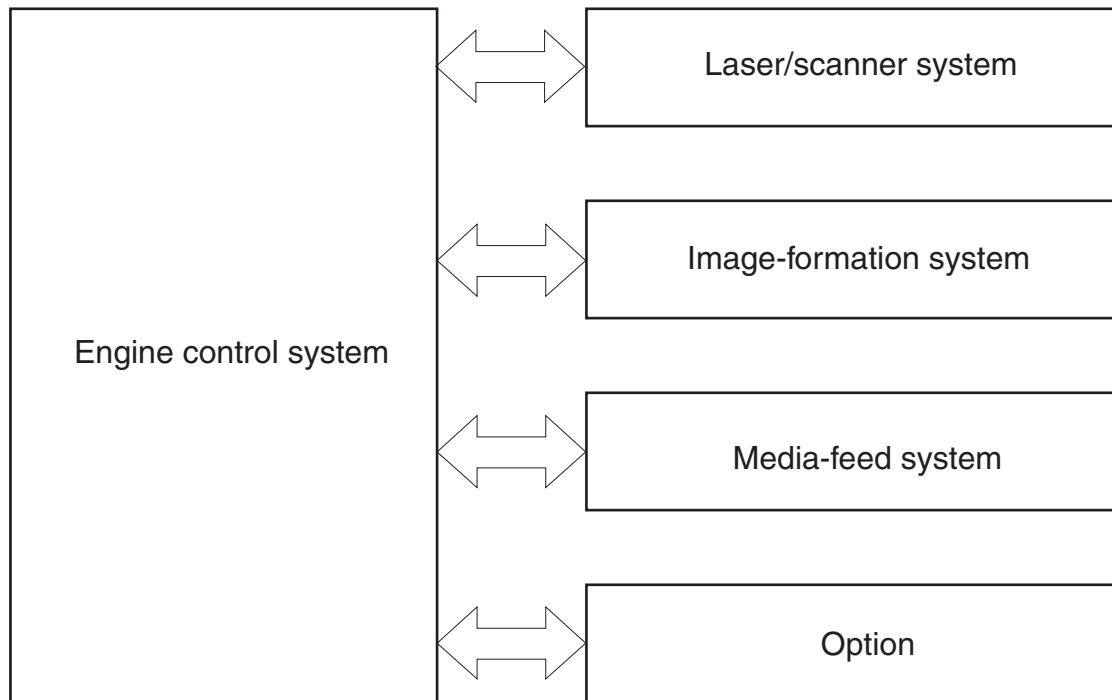
Basic operation

The product routes all high-level processes through the formatter, which stores font information, processes the print image, and communicates with the host computer.

The basic product operation comprises the following systems:

- The engine-control system, which includes the power supply and the DC controller printed circuit assembly (PCA)
- The laser/scanner system, which forms the latent image on the photosensitive drum
- The image-formation system, which transfers a toner image onto the paper
- The media feed system, which uses a system of rollers and belts to transport the paper through the product
- Option (optional paper feeder)

Figure 1-1 Relationship between the main product systems



The interconnect board (ICB) provides connections from the formatter to the following components:

- DC controller (DCC)
- Scan control board (SCB)
- Control panel, USB wakeup port, USB hardware integration pocket through a USB cable

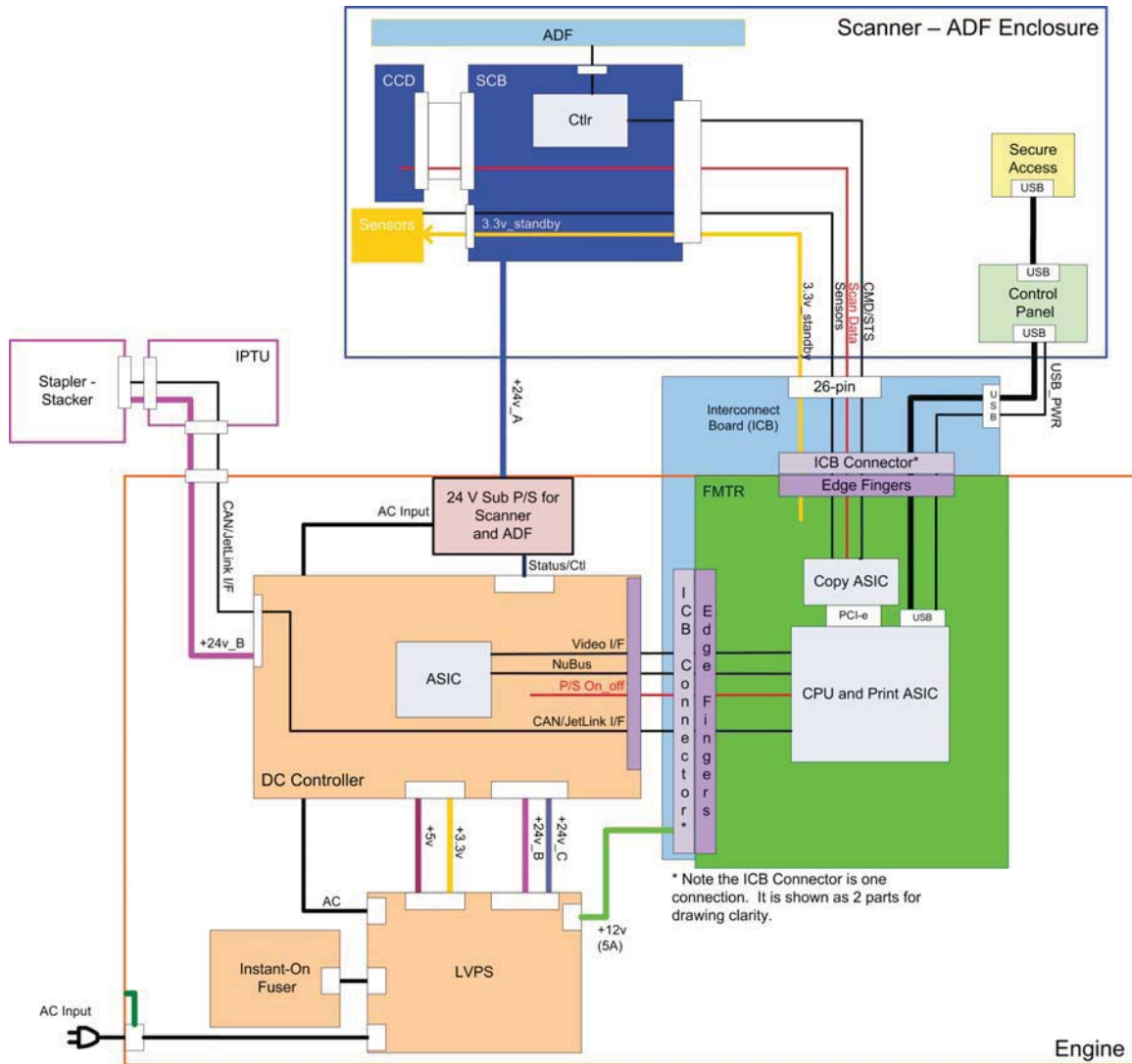
The formatter receives +12 volts from the low voltage power supply (LVPS).

The document feeder/scanner receives 24 volts from the scanner power supply, which is powered by an AC line from the LVPS.

The intermediate paper transport unit (IPTU) receives +24 volts and 3.3 volts from the DCC.

The Stapler/Stacker receives +24 volts and the JetLink control lines for communications from the DCC.

Figure 1-2 System block diagram



Sequence of operation

The DC controller PCA controls the operating sequence, as described in the following table.

Table 1-1 Sequence of operation

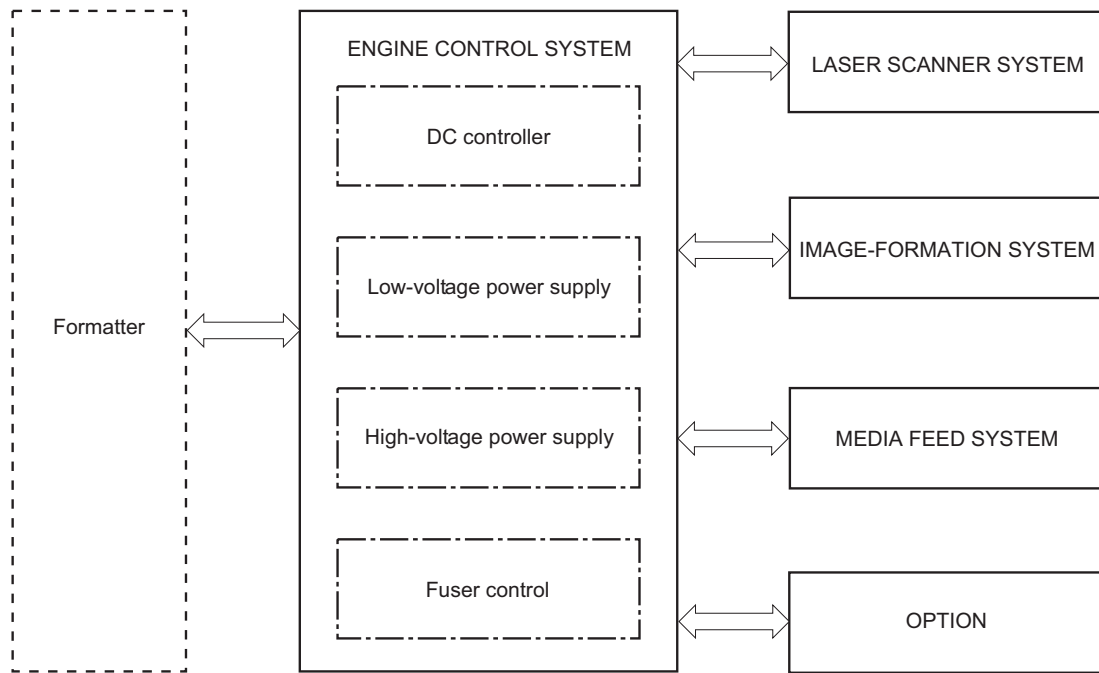
Period	Duration	Description
Waiting	From the time the power is turned on, the door is closed, or when the product exits Sleep mode until the product is ready for printing	<ul style="list-style-type: none">• Heats the fuser sleeve in the fuser• Pressurizes the pressure roller in the fuser• Detects the print cartridges• Moves the ITB and developing unit to the home position• Cleans the ITB and secondary transfer roller
Standby	From the end of the waiting sequence or the last rotation until the formatter receives a print command or until the product is turned off	<ul style="list-style-type: none">• The product is in the Ready state.• The product enters Sleep mode if the sleep command is received from the formatter.• The product calibrates if it is time for an automatic calibration.
Initial rotation	From the time the formatter receives a print command until the paper enters the paper path	<ul style="list-style-type: none">• Activates the high-voltage power supply• Prepares each laser/scanner unit• Warms the fuser to the correct temperature
Printing	From the time the first sheet of paper enters the paper path until the last sheet has passed through the fuser	<ul style="list-style-type: none">• Forms the image on the photosensitive drums• Transfers the toner to the paper• Fuses the toner image onto the paper
Last rotation	From the time the last sheet of paper exits the fuser until the motors stop rotating	<ul style="list-style-type: none">• Moves the last printed sheet into the output bin• Stops the high-voltage power supply• Stops each laser/scanner unit• If another print command is received, the product enters the initial rotation period when the last rotation is complete.

Engine-control system

The engine-control system receives commands from the formatter and interacts with the other main systems to coordinate all product functions. The engine-control system consists of the following components:

- DC controller
- Low-voltage power supply
- High-voltage power supply
- Fuser control

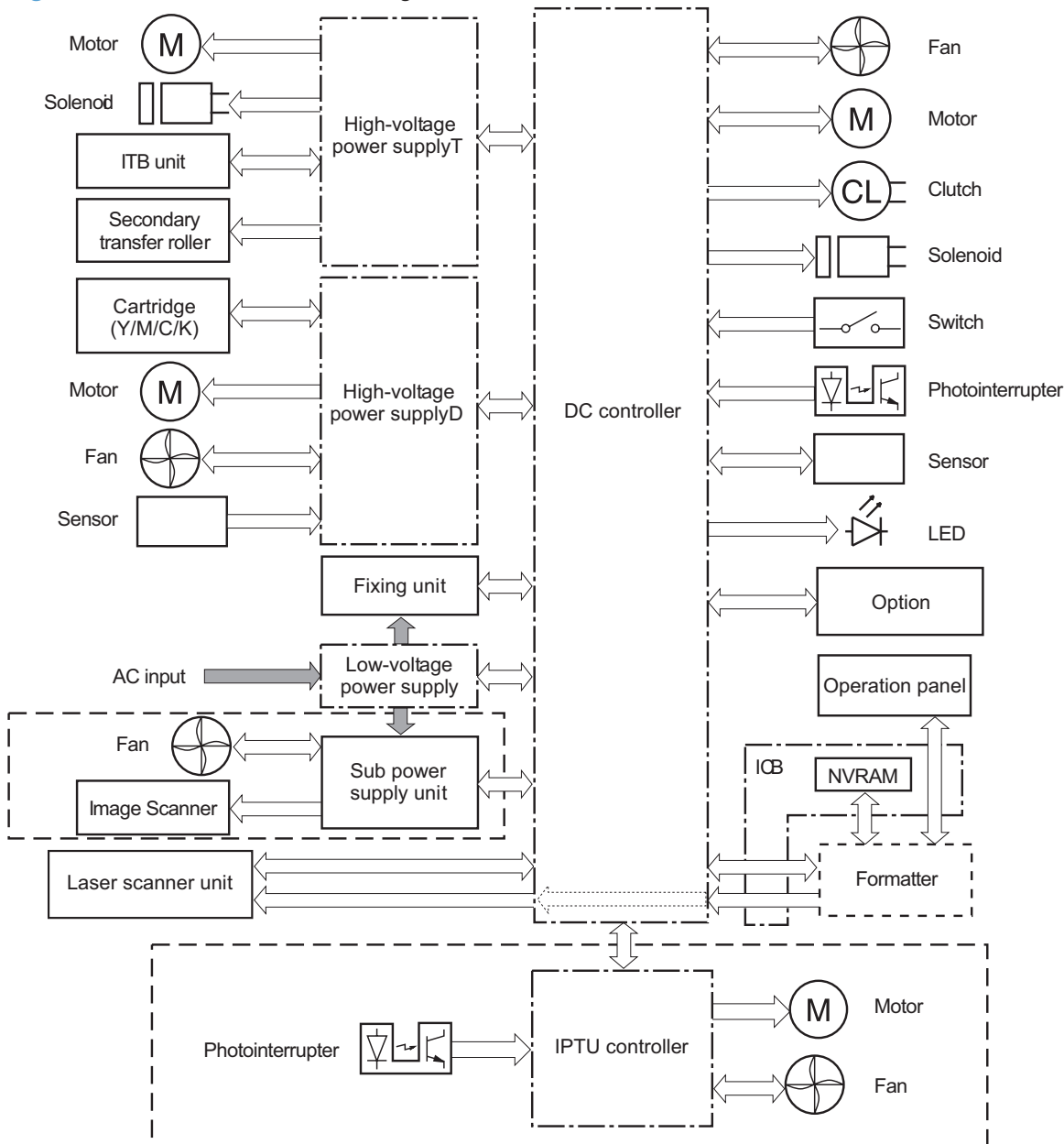
Figure 1-3 Engine-control system



DC controller

The DC controller controls the operational sequence of the product.

Figure 1-4 DC controller block diagram



Solenoids

Table 1-2 Solenoids

Component abbreviation	Component name
SL1	Primary transfer roller disengagement solenoid
SL2	Duplex reverse solenoid

Table 1-2 Solenoids (continued)

Component abbreviation	Component name
SL3	Multipurpose-tray pickup solenoid
SL4	Cassette pickup solenoid

Clutches

Component abbreviation	Component name
CL1	Duplex re-pickup clutch

Switches

Table 1-3 Switches

Component abbreviation	Component name
SW1	5V interlock switch
SW2	24V interlock switch
SW3	Power switch
SW4	Cassette media size switch
SW5	Front door switch
SW6	Right door switch
	Test print switch

Sensors

Table 1-4 Sensors

Component abbreviation	Component name
SR1	Yellow drum home position sensor
SR2	Magenta drum home position sensor
SR3	Cyan drum home position sensor
SR4	Black drum home position sensor
SR5	Fuser delivery sensor
SR7	Fuser pressure release sensor
SR8	MP-tray-media-presence sensor
SR9	Primary-transfer-roller disengagement sensor
SR10	New ITB sensor
SR11	Developer alienation sensor
SR14	Loop sensor 1
SR15	Loop sensor 2
SR20	Top of page (TOP) sensor
SR21	Media sensor
SR22	Duplex re-pickup sensor
SR23	Tray 2 paper surface 1 sensor
SR24	Tray 2 paper surface 2 sensor
SR25	Tray 2 paper present sensor
SR26	IPTU media full sensor
SR27	IPTU media feed sensor
SR28	Image scanner unit open sensor
	RD sensor
	Environment sensor (temperature and humidity)
	Yellow toner-level sensor
	Magenta toner-level sensor
	Cyan toner-level sensor
	Black toner-level sensor
	Residual toner full sensor
TH4	Laser scanner temperature sensor

Motors

The product has 13 motors. The motors drive the components in the paper-feed and image-formation systems.

Table 1-5 Motors

Abbreviation	Name	Purpose	Failure detection
M1	ITB motor	Drives the ITB and residual toner feed screw	Yes
M2	Fuser motor	Drives the fuser sleeve, pressure roller, fuser pressure roller, and primary transfer roller disengagement	Yes
M3	Y drum motor	Drives the photosensitive drum (yellow), developing roller (yellow), and primary charging roller (yellow)	Yes
M4	M drum motor	Drives the photosensitive drum (magenta), developing roller (magenta), and primary charging roller (magenta)	Yes
M5	C drum motor	Drives the photosensitive drum (cyan), developing roller (cyan), and primary charging roller (cyan)	Yes
M6	Bk drum motor	Drives the photosensitive drum (black), developing roller (black), and primary charging roller (black)	Yes
M7	Lifter motor	Drives the lifter for the cassette	Yes
M8	Cyan/black scanner motor	Drives the scanner mirror in the cyan/black laser scanner	Yes
M9	Yellow/magenta scanner motor	Drives the scanner mirror in the yellow/magenta laser scanner	Yes
M10	Developing disengagement motor	Drives the developing unit disengagement	No
M11	Duplex reverse motor	Drives the duplex reverse roller and duplex feed roller	No
M12	Residual toner-feed motor	Drives the residual toner feed screw	Yes

Table 1-5 Motors (continued)

Abbreviation	Name	Purpose	Failure detection
M13	Pickup motor	Drives the cassette pickup roller, MP tray pickup roller, feed roller, and cassette separation roller	No
M14	IPTU feed motor	Drive the IPTU feed rollers and IPTU delivery roller	No

The DC controller determines if a motor has failed and notifies the formatter when it encounters the following conditions:

The DC controller detects a failure by monitoring a motor:

- Startup failure: the motor does not reach a specified speed within a specified time from when the motor starts.
- Rotational failure: the rotational speed of the motor is not in the specified range for a specified time after the motor reaches a specified speed.
- Lock detection (for the residual toner feed motor): the value of the motor drive signal voltage is not in the specified range for a specified time.

The DC controller detects a failure by monitoring a part related to the motor:

- Developing disengagement motor: A specified signal is not detected from the developing disengagement sensor during a developing assembly operation.
- Lifter motor: The cassette media stack surface sensor does not detect the media surface within a specified time period after the lifter motor starts.
- Scanner motor: The scanner motor does not reach a specified speed within a specified period after the scanner assembly starts.
- A specified beam-detect (BD) interval is not detected during a print operation.

Fans

The product has eight fans for preventing the temperature from rising in the product.

Table 1-6 Fans

Abbreviation	Name	Cooling area	Type	Speed
FM1	Power supply fan	Around the power supply unit	Intake	Full/half
FM2	Cartridge fan	Around the cartridges	Intake	Full/half

Table 1-6 Fans (continued)

Abbreviation	Name	Cooling area	Type	Speed
FM3	Exhaust fan 2	Around the delivery assembly	Exhaust	Full/half
FM4	Exhaust fan 1	Around the cartridge	Exhaust	Full/half
FM5	Sub power supply fan	Around the sub power supply	Intake	Full
FM6	IPTU fan 1	Around the IPTU media feed unit and the product delivery assembly	Intake	Full
FM7	IPTU fan 2	Around the product delivery assembly	Exhaust	Full
FMx	Formatter fan	Formatter area		

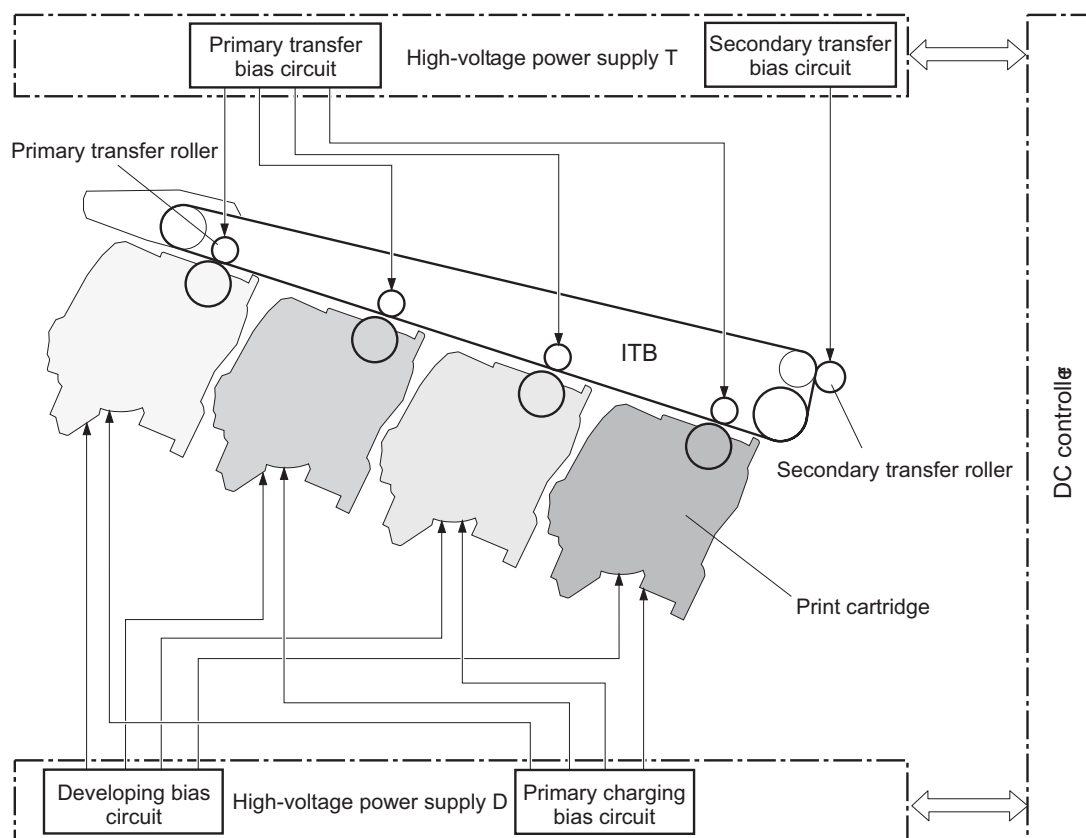
The DC controller determines if there is a fan failure and notifies the formatter if the fan locks for a specified time from when the fan starts.

High-voltage power supply

The DC controller controls the high-voltage power supply to generate biases. The high-voltage power supply delivers the high-voltage biases to the following components used to transfer toner during the image-formation process:

- Primary-charging roller (in the cartridge)
- Developing roller (in the cartridge)
- Primary-transfer roller
- Secondary-transfer roller

Figure 1-5 High-voltage power supply circuits



The high-voltage power supply contains several separate circuits.

Table 1-7 High-voltage power supply circuits

Circuit	Description
Primary-charging-bias generation	The primary charging bias negatively charges the surface of the photosensitive drum to prepare for image formation. The primary-charging-bias circuit in the high-voltage power supply generates the biases for each color.
Developing-bias generation	The developing bias adheres toner to an electrostatic latent image formed on the photosensitive drum. The developing-bias circuit in the high-voltage power supply generates the biases for each color.

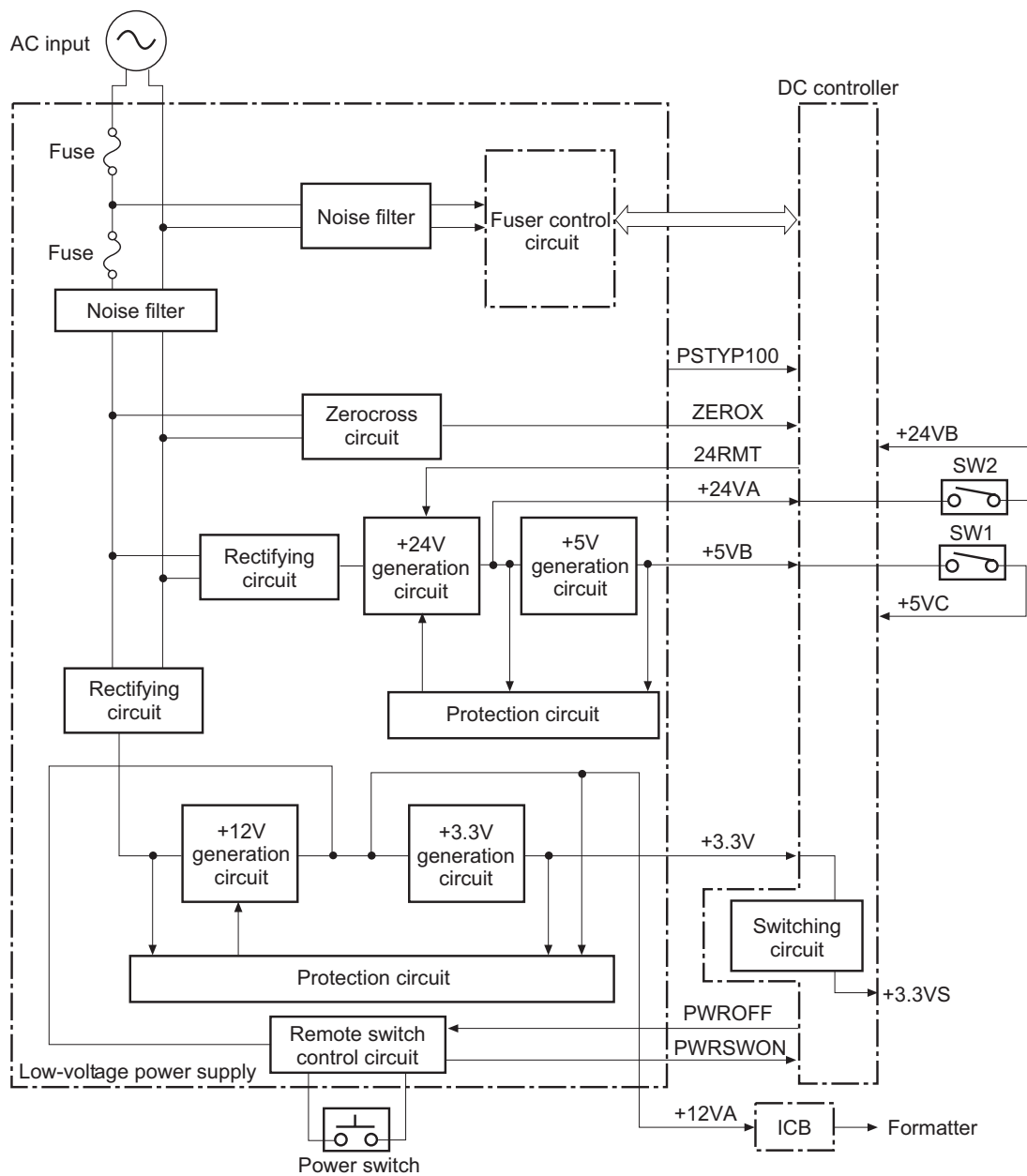
Table 1-7 High-voltage power supply circuits (continued)

Circuit	Description
Primary-transfer-bias generation	The primary transfer bias transfers the toner from each photosensitive drum onto the ITB. The primary transfer bias circuit in the high-voltage power supply generates the biases for each color.
Secondary-transfer-bias generation	The secondary transfer bias transfers the toner image from the ITB onto the paper. The secondary transfer bias circuit in the high-voltage power supply generates the bias. The reversed bias transfers residual toner on the secondary transfer roller back to the ITB. The residual toner on the ITB is deposited in the toner collection box.

Low-voltage power supply

The low-voltage power-supply circuit converts the AC power from the wall receptacle into the DC voltage that the product components use. The product has two low-voltage power-supplies for 110 Volt or 220 Volt input.

Figure 1-6 Low-voltage power-supply circuit



The low-voltage power supply converts the AC power into three DC voltages, which it then subdivides, as described in the following table.

Table 1-8 Converted DC voltages

Main DC voltage	Sub-voltage	Behavior
+24 V	+24 VA	Constantly supplied
	+24 VB	Interrupted when the front door or right door open
+5 V	+5 VB	Constantly supplied
	+5 VC	Interrupted when the front door or right door open
+3.3 V	3.3 V	Constantly supplied
	3.3 VS	Stopped during Sleep (powersave) mode

Overcurrent/overvoltage protection

The low-voltage power supply stops supplying the DC voltage to the product components whenever it detects excessive current or abnormal voltage from the power source. If DC voltage is not being supplied from the low-voltage power supply, the protective function might be running. In this case, turn the power off and unplug the power cord. Do not turn the power switch on until the root cause is found. The DC controller notifies the formatter of a low-voltage power supply failure when the protective function is activated. In addition, the low-voltage power supply circuit and the fuser control unit have a fuse to protect against overcurrent. If overcurrent flows into the AC line, the fuse blows to stop AC power.

Safety

For personal safety, the product interrupts 24 VB power to the fuser, high-voltage power supply, and motors, in addition to +5 VC to the laser scanners when the front or right door is opened. The power switch is on the dc line so that the ac power flows even if the power switch is turned off. Unplug the power cord before disassembling the product.

Voltage detection

The product detects the power supply voltage that is connected to the product. The DC controller monitors the POWER SUPPLY VOLTAGE (PSTYP100) signal and detects power supply voltage, whether 100 V or 200 V, to control the fuser operation.

Sleep (powersave) mode

Sleep mode conserves energy by stopping the power to several components when the product is idle. If the DC controller detects voltage that is too high when the product is in Sleep mode, it determines that the low-voltage power supply has failed, and it notifies the formatter.

Low-voltage power supply failure

The DC controller determines a low-voltage power supply failure and notifies the formatter when the low-voltage power supply does not supply +24 V.

Fuser control

The fuser heater-control circuit and the fuser heater safety circuit control the fuser temperature according to commands from the DC controller.

Figure 1-7 Fuser components

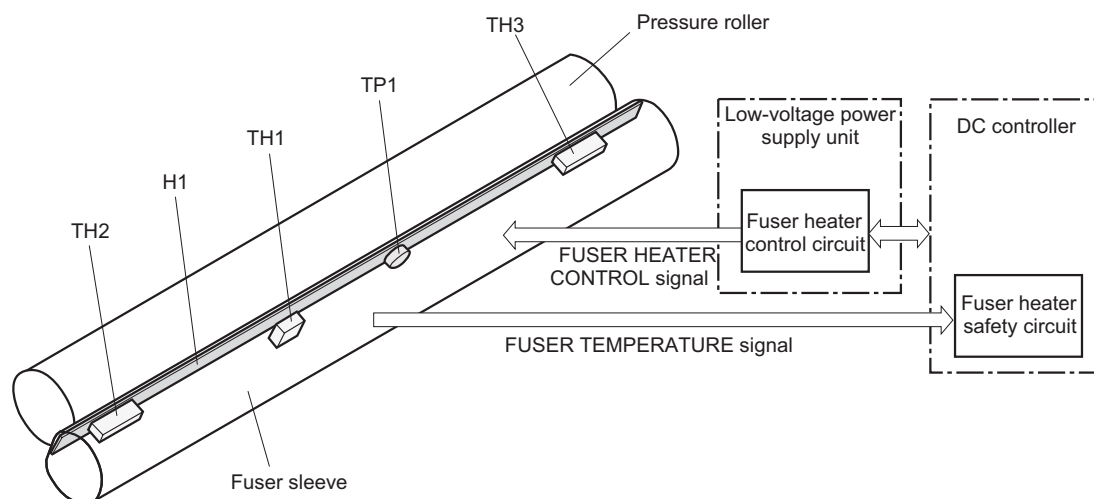


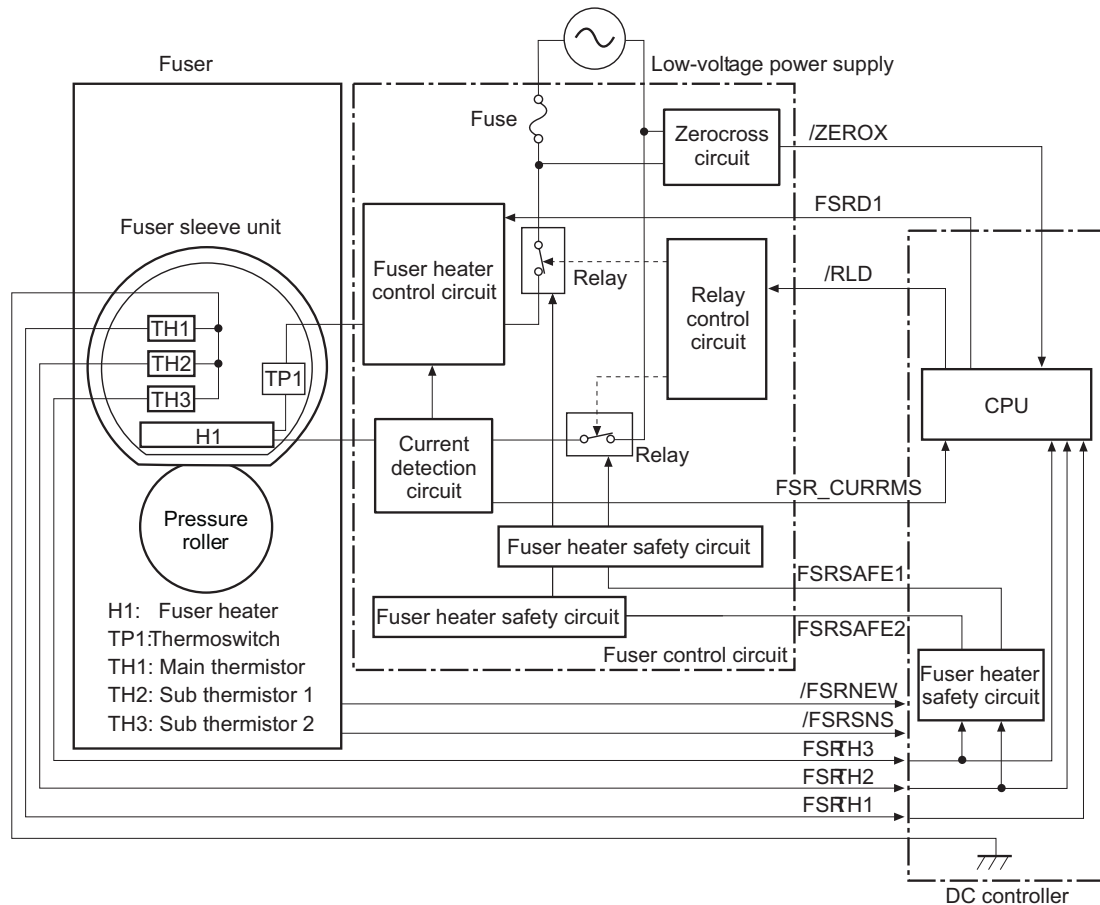
Table 1-9 Fuser components

Type of component	Abbreviation	Name	Function
Heaters	H1	Fuser heater	Heats the fuser sleeve.
Thermistors (Contact type)	TH1	Main thermistor	Detects the center temperature of the fuser sleeve.
	TH2	Sub thermistor 1	Detects the temperature at one end of the fuser heater.
	TH3	Sub thermistor 2	
Thermoswitches (Contact type)	TP1	For the fuser heater	Opens in the event of high temperature fault

Fuser temperature control

The fuser temperature control maintains the target surface temperature of the fuser sleeve.

Figure 1-8 Fuser temperature-control circuit



Fuser sleeve temperature protection

The fuser heater controls the temperature of the fuser sleeve. The DC controller detects the center area temperature by monitoring the main thermistor. The DC controller controls the FIXING HEATER CONTROL (FSRD1) signal, so that the fuser sleeve remains at the targeted temperature.

- **Protective function:** The protective function detects rising temperatures in the fuser and interrupts power to the fuser heater. The following four protective components prevent the fuser sleeve and pressure roller from excessive rising temperature:
 - DC controller
 - Fuser heater safety circuit

- Current detection circuit
- Thermoswitch
- **DC controller:** The DC controller monitors the detected temperature of the main thermistor and sub thermistors. The DC controller deactivates the FIXING HEATER CONTROL signal and releases the relay to interrupt power supply to the fuser heater under the following conditions:
 - TH1: 230° C (446° F) or higher
 - TH2: 285° C (545° F) or higher
 - TH3: 285° C (545° F) or higher
- **Fuser-heater safety circuit:** The fuser heater safety circuit monitors the detected temperature of the sub thermistors. The fuser heater safety circuit releases the relay to interrupt power supply to the fuser heater under the following conditions:
 - TH2: 290° C (554° F) or higher
 - TH3: 290° C (554° F) or higher
- **Current-detection protection circuit:** The current detection circuit monitors the current flowing through the fuser heater control circuit. The current detection circuit deactivates the fuser heater control circuit to interrupt power supply to the fuser heater when it detects the current higher than a specified value.
- **Thermoswitch:** If the temperature in the heaters is abnormally high, and the temperature in the thermoswitches exceeds a specified value, the contact to the thermoswitch breaks. Following are the thresholds for each thermoswitch:
 - TP1: 270° C (518° F) or higher



NOTE: When the thermoswitches reach this temperature, the temperature on the fuser rollers is about 320° C (608° F).


Failure detection

The DC controller determines a fuser unit failure, deactivates the FIXING HEATER CONTROL signal, releases the relay to interrupt power supply to the fuser heater, and notifies the formatter of a failure status when it encounters any of following conditions:

- **Abnormally high temperatures:** Temperatures are too high for any of the following components, at any time:
 - TH1: 230° C (446° F) or higher
 - TH2: 285° C (545° F) or higher
 - TH3: 285° C (545° F) or higher
- **Abnormally low temperatures:** Temperatures are too low at any of the following components after the product has initialized.
 - TH1: 120° C (248° F) or lower
 - TP2 or TP3: 100° C (212° F) or lower
- **Abnormal temperature rise:** The DC controller determines an abnormal temperature rise if the detected temperature of TH1 does not rise 2° C within a specified time after the fuser motor is turned on, or if the detected temperature of the thermistors does not rise to a specified temperature for a specified time after the fuser motor is turned on.
- **Thermistor open:** The DC controller determines a thermistor open if:
 - The detected temperature of TH1 is kept at 12° C (53° F) or lower for a specified time after the fuser motor is turned on.
 - The detected temperature of TH2 is kept at 4° C (39° F) or lower for a specified time.
 - The detected temperature of TH3 is kept at 4° C (39° F) or lower for a specified time.
- **Drive-circuit failure:** The DC controller determines a drive-circuit failure:
 - If the detected power supply frequency is out of a specified range when the product is turned on or during the standby period
 - If the current detection circuit detects a current value that is out of a specified range
- **Fuser discrepancy:** The DC controller determines a fuser type mismatch when it detects an unexpected power supply voltage.


Fuser unit identification

The product detects the type and presence of the fuser. The DC controller detects whether the fuser is installed and its type by monitoring the FIXING UNIT IDENTIFICATION (FSRSNS) signal when the product is turned on or when the right door is closed. The DC controller determines a low-voltage power supply failure and notifies the formatter when it fails to detect the type or presence of the fuser.

 **NOTE:** This product detects if the correct fuser for the product is installed. The fuser from a different product (for example, the HP Color LaserJet CP 3525 Series printer) can be installed in this product, but it will not correctly function.

Fuser unit life detection

The product detects the remaining life of a fuser. The DC controller recognizes a new fuser from the NEW FIXING UNIT (/FSRNEW) signal. The DC controller determines a fuser's end of life and then notifies the formatter when a specified number of pages has been printed after the fuser was replaced.

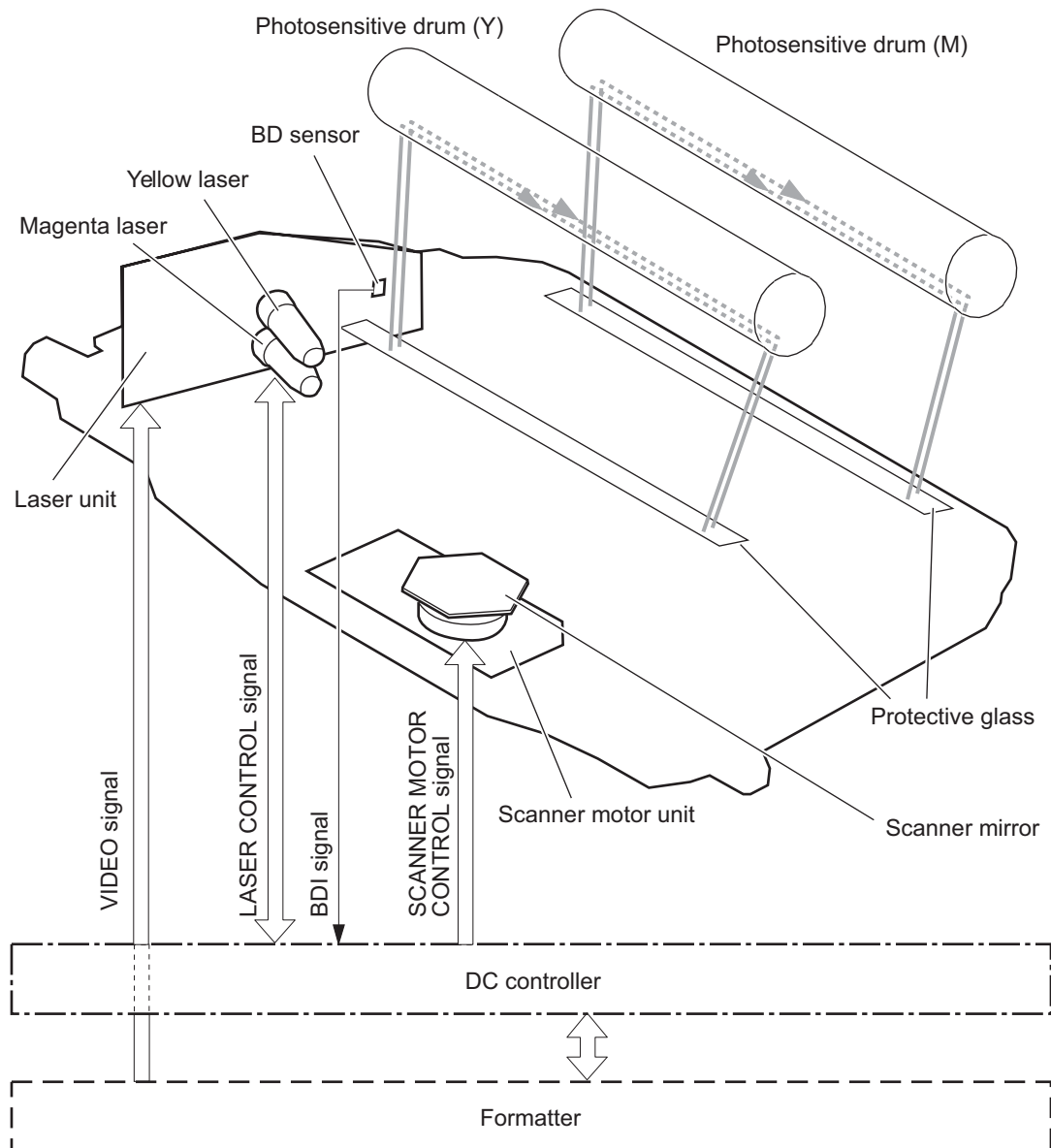
 **NOTE:** The product detects a new fuser using a fusible link that breaks down after 100 pages of printing. If a new fuser is installed for troubleshooting purposes, be sure to remove it before printing 100 pages.

Laser/scanner system

The laser/scanner system forms the latent electrostatic image on the photosensitive drums according to the VIDEO signals sent from the formatter. The product has two laser/scanners: one for yellow and magenta and the other for cyan and black.

The main components of the laser/scanner system are the laser unit and the scanner motor unit, which are controlled by the signals sent from the DC controller.

Figure 1-9 Laser/scanner system



Laser/scanner failure

The DC controller determines that a laser/scanner has failed when any of the following conditions occurs:

- **Laser failure:** The detected laser intensity does not match a specified value when the product initializes.
- **Scanner motor startup failure:** The scanner motor does not reach a specified rotation within a specified period from when the laser scanner starts driving.
- **Scanner-motor abnormal rotation:** When a specified BD interval is not detected during a print operation, a BD error is determined. If the BD interval does not recover within a specified period after the BD error occurs, the product determines a scanner motor abnormal rotation.

The laser/scanner system does not have a mechanical laser shutter. For safety reason, the product has a interlock switch. The interlock switch is turned off to interrupt +5 V power supply to the laser/scanner system, when the front or right door is open.

Protective-glass cleaners

Each laser/scanner has two openings which allow the laser beam to pass to the surface of the photosensitive drum. These openings are covered by protective glass. When the protective glass gets dirty (for example, by paper dust or toner) a protective-glass cleaner (PGC) cleans them.



NOTE: When a glass is dirty, streaks appear on the printed page in the process direction.

The PGC is a cleaning pad which slides along the laser shutter. With the front door open, the laser shutter is positioned over the glass. As a print cartridge is inserted, the cleaning pad is pushed down and wipes the glass. When the front door is closed after cartridge insertion, the laser shutter (and PGC) move away from the glass which allows the laser beam to pass through the glass.

When the front door is opened, the laser shutter and PGC move back into position over the glass. When the cartridge is pulled out, the cleaning pad is returned to its starting position at the front of the cartridge opening.

Figure 1-10 Protective-glass cleaners (PGCs)

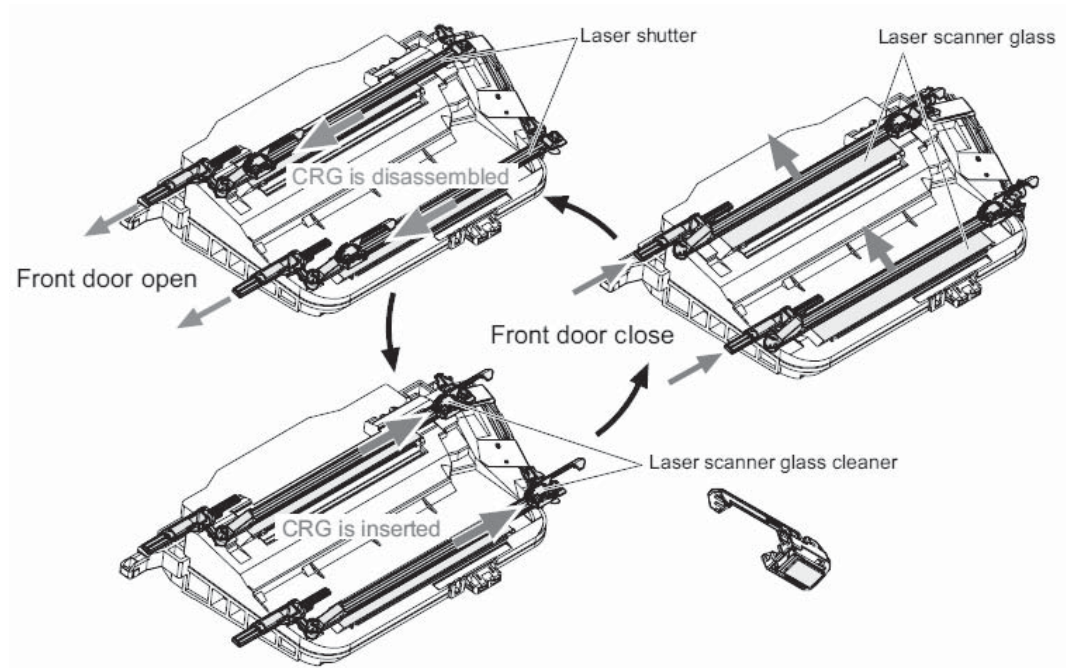


Image-formation system

The image-formation system creates the printed image on the paper. The system consists of the following components:

- Print cartridges
- ITB
- Secondary transfer roller
- Fuser
- Laser /scanner units

The DC controller controls the laser scanner unit and each of the high-voltage power supplies to form the toner image on the photosensitive drum surface, according to the VIDEO signals. The toner image is then transferred to the print-media and fused.

Figure 1-11 Image-formation system

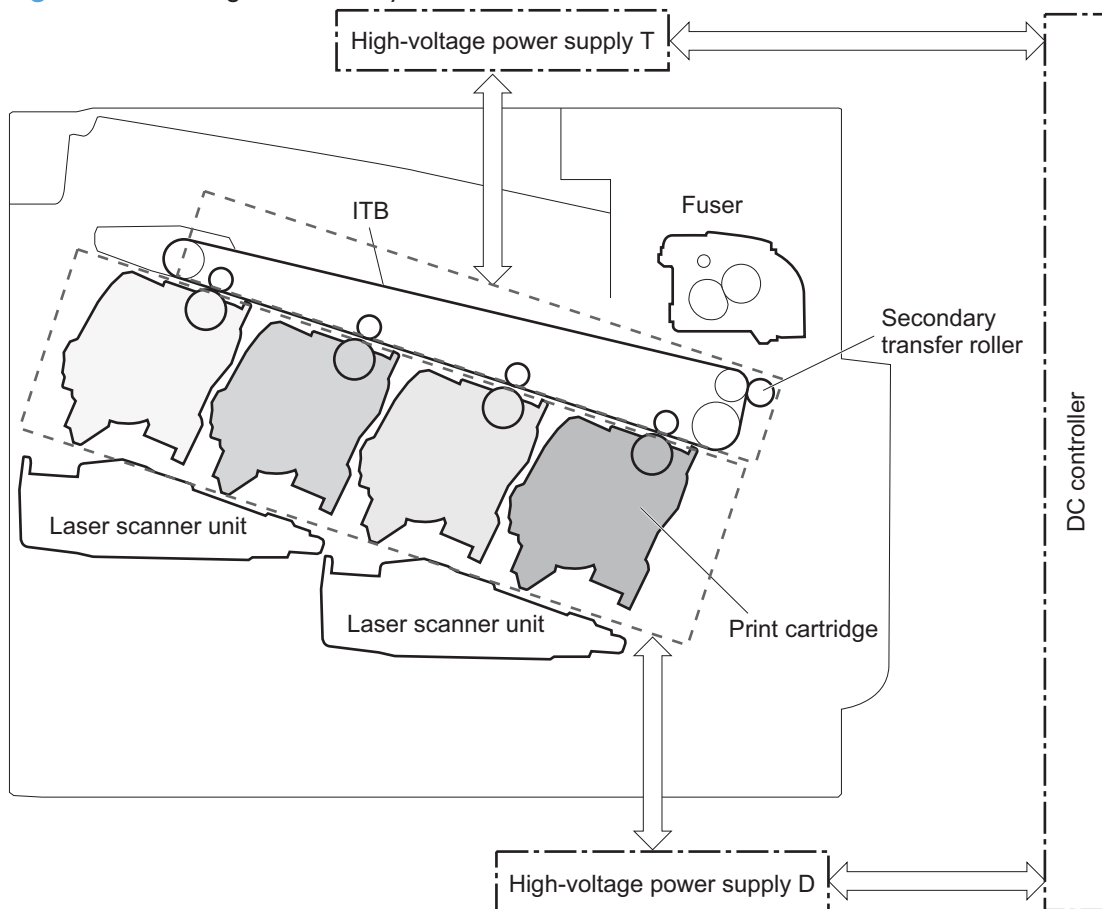


Figure 1-12 Image-formation drive system

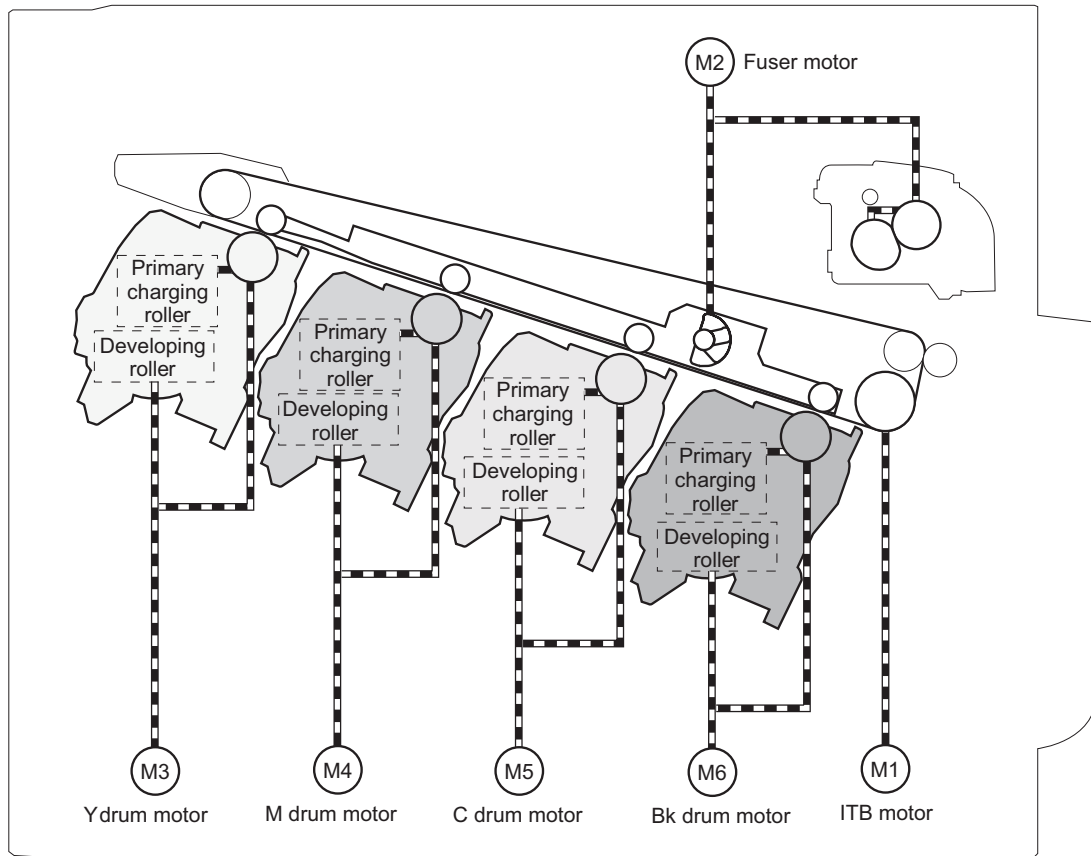
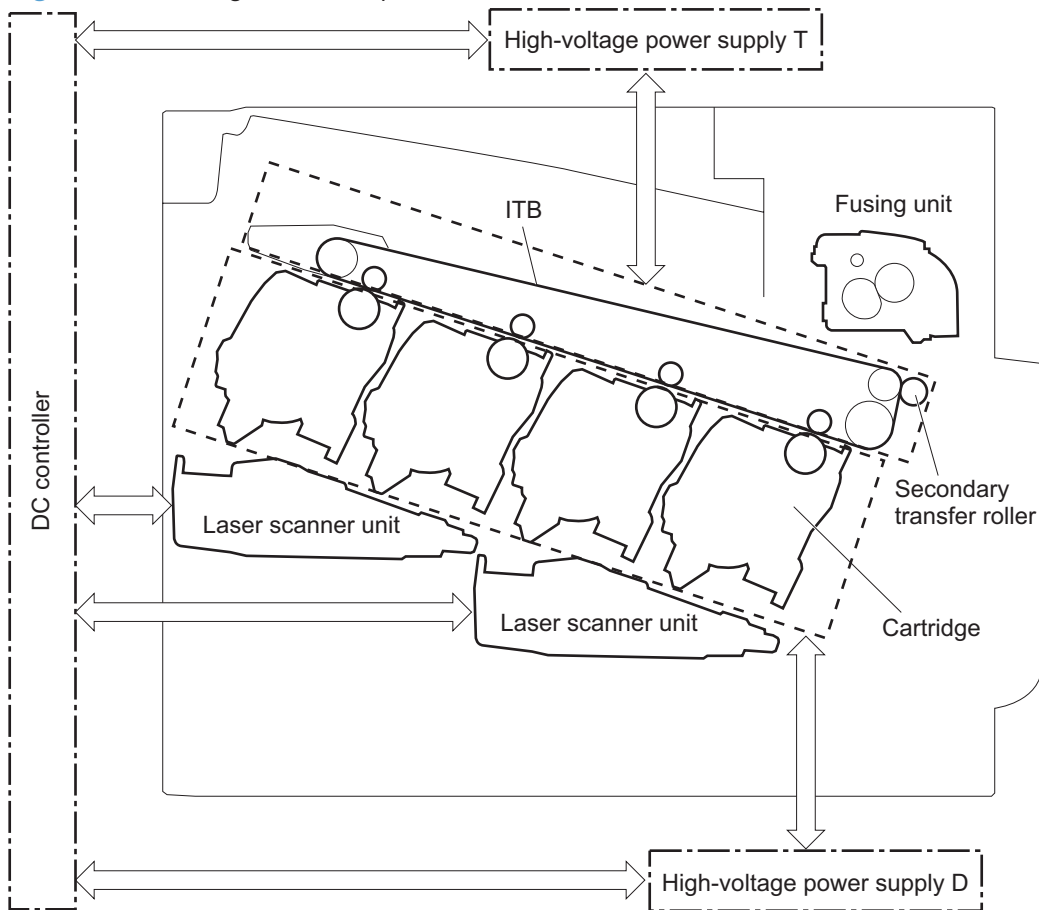


Image-formation process

The image-formation system consists of ten steps divided into six functional blocks.

Figure 1-13 Image-formation process



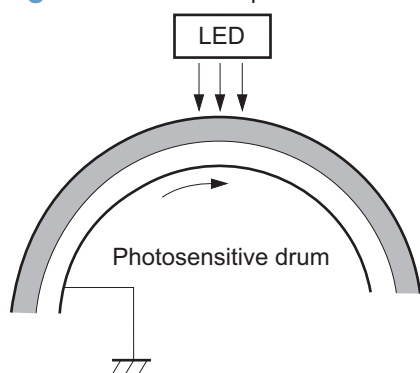
Functional block	Steps	Description
Latent image formation	1. Pre-exposure	An invisible latent image forms on the surface of the photosensitive drums.
	2. Primary charging	
	3. Laser-beam exposure	
Development	4. Development	Toner adheres to the electrostatic latent image on the photosensitive drums.
Transfer	5. Primary transfer	The toner image transfers to the ITB and later to the paper.
	6. Secondary transfer	
	7. Separation	
Fusing	8. Fusing	The toner fuses to the paper to make a permanent image.

Functional block	Steps	Description
ITB cleaning	9. ITB cleaning	Residual toner is removed from the ITB.
Drum cleaning	10. Drum cleaning	Residual toner is removed from the photosensitive drums.

Step 1: Pre-exposure

Light from the pre-exposure LED strikes the surface of the photosensitive drum to remove any residual electrical charges from the drum surface.

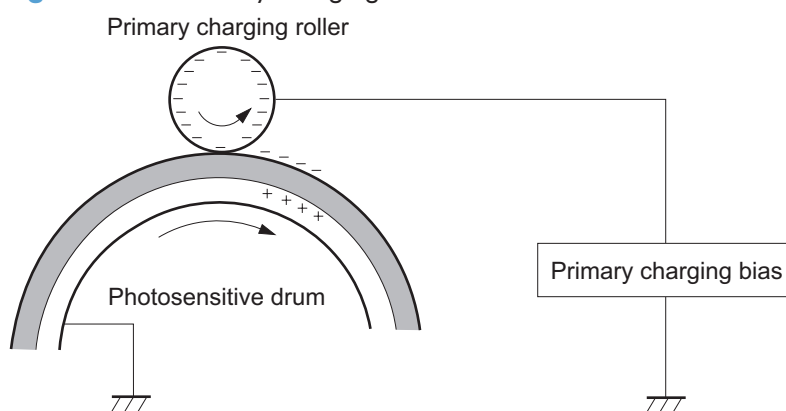
Figure 1-14 Pre-exposure



Step 2: Primary charging

The primary-charging roller contacts the photosensitive drum and charges the drum with negative potential.

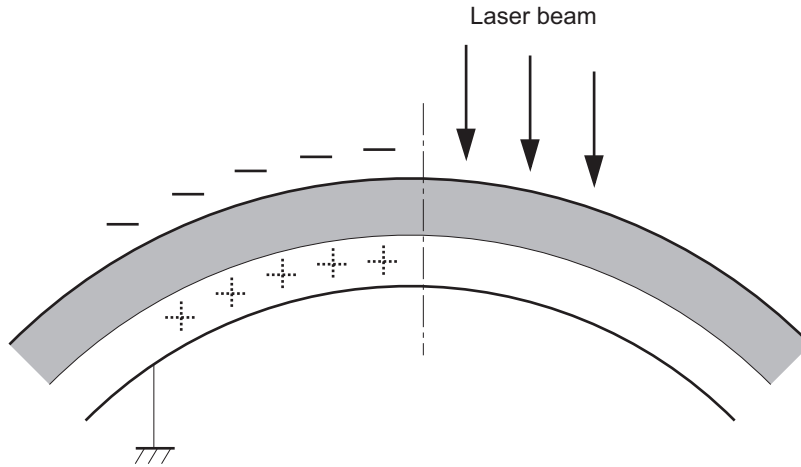
Figure 1-15 Primary charging



Step 3: Laser-beam exposure

The laser beam strikes the surface of the photosensitive drum in the areas where the image will form. The negative charge neutralizes in those areas, which are then ready to accept toner.

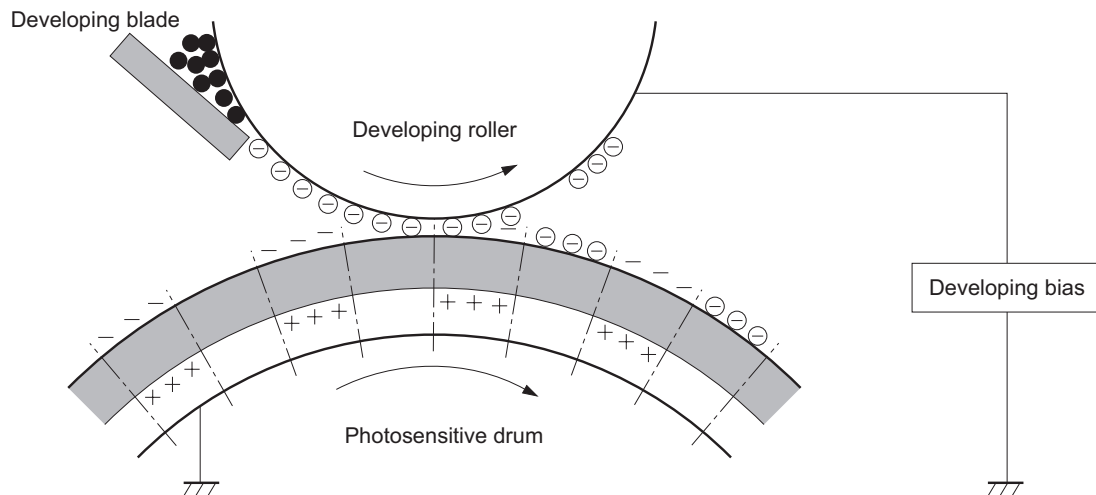
Figure 1-16 Laser-beam exposure



Step 4: Development

Toner acquires a negative charge as the developing cylinder contacts the developing blade. Because the negatively charged surface of the photosensitive drums have been neutralized where they have been struck by the laser beam, the toner adheres to those areas on the drums. The latent image becomes visible on the surface of each drum.

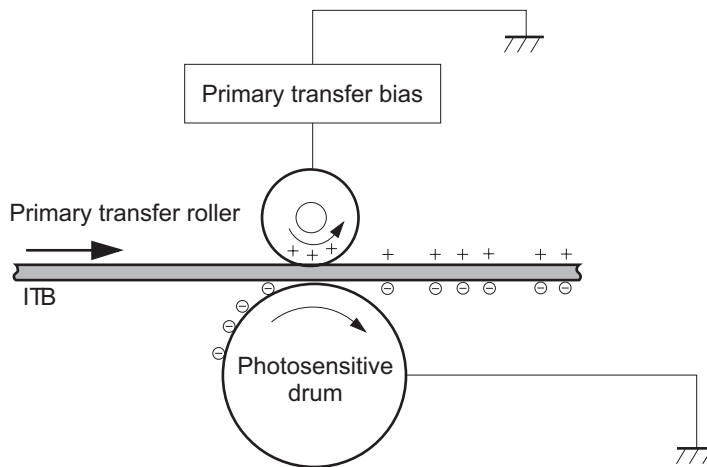
Figure 1-17 Development



Step 5: Primary transfer

The positively charged primary-transfer rollers contact the ITB, giving the ITB a positive charge. The ITB attracts the negatively charged toner from the surface of each photosensitive drum, and the complete toner image transfers onto the ITB.

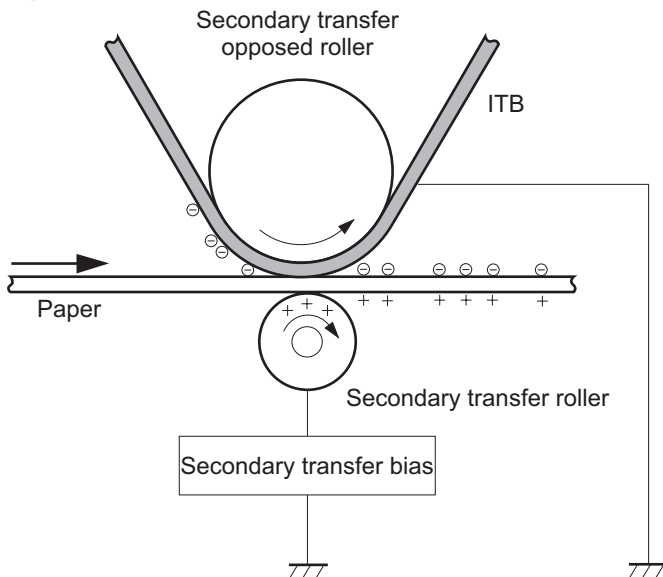
Figure 1-18 Primary transfer



Step 6: Secondary transfer

The paper acquires a positive charge from the secondary-transfer roller, and so it attracts the negatively charged toner from the surface of the ITB. The complete toner image transfers onto the paper.

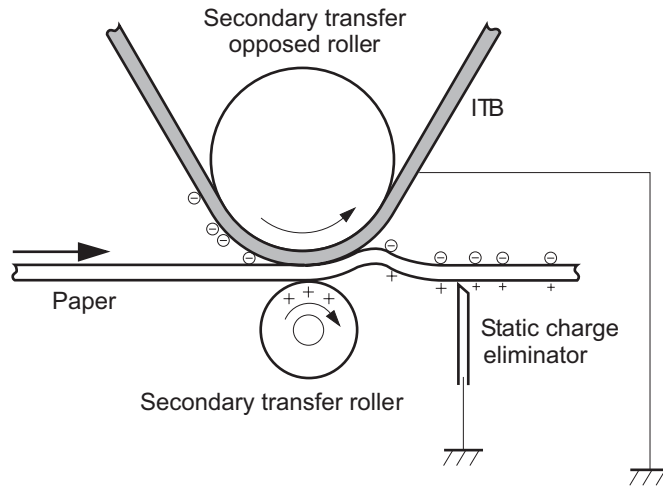
Figure 1-19 Secondary transfer



Step 7: Separation

The stiffness of the paper causes it to separate from the ITB as the ITB bends. The static-charge eliminator removes excess charge from the paper to make sure that the toner fuses correctly.

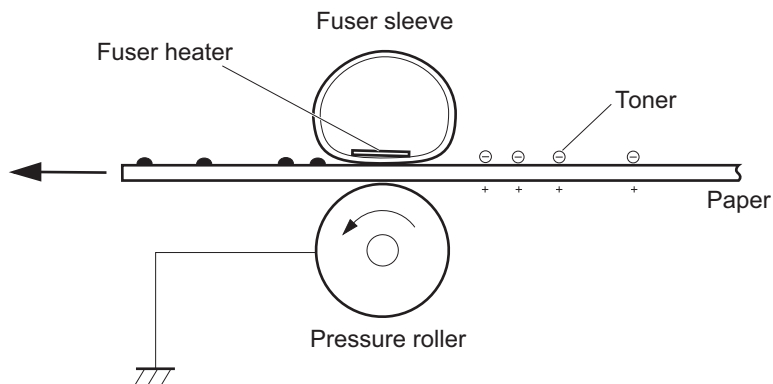
Figure 1-20 Separation



Step 8: Fusing

To create the permanent image, the paper passes through heated, pressurized rollers to melt the toner onto the page.

Figure 1-21 Fusing

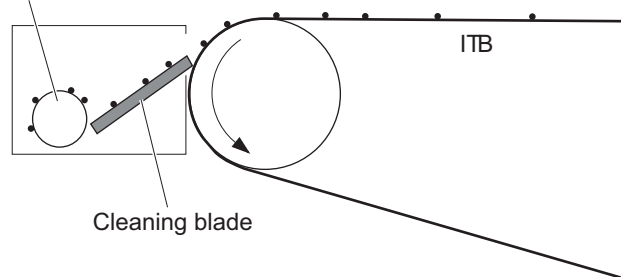


Step 9: ITB cleaning

The cleaning blade scrapes the residual toner off the surface of the ITB. The residual toner feed screw deposits residual toner in the toner collection box.

Figure 1-22 ITB cleaning

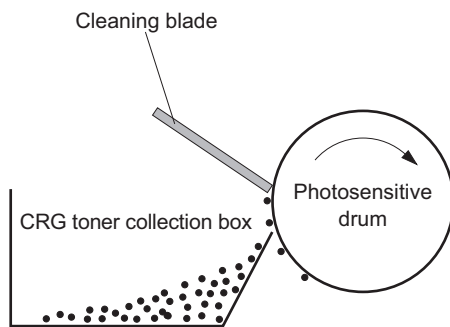
Residual toner feed screw



Step 10: Drum cleaning

The cleaning blade scrapes the residual toner off the surface of the photosensitive drum, and toner is deposited in the toner collection box in the cartridge.

Figure 1-23 Drum cleaning



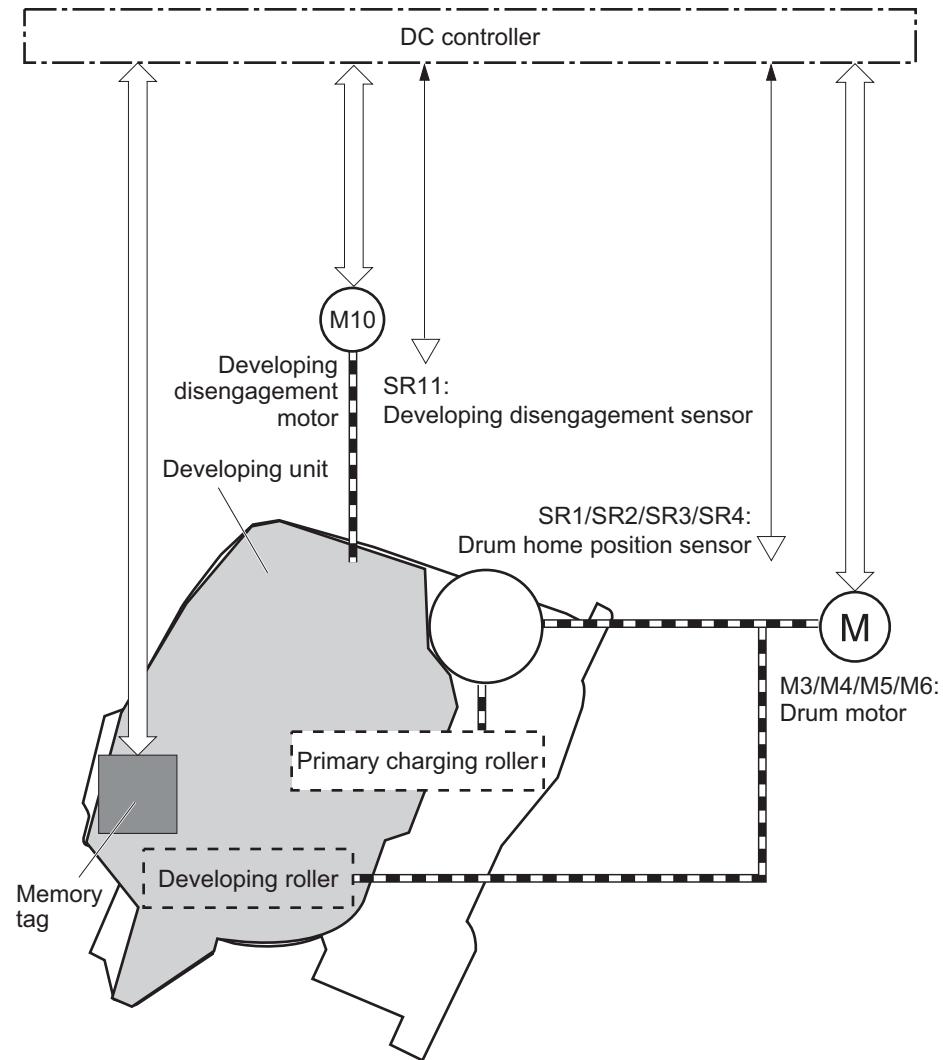
Print cartridge

Each print cartridge is filled with toner and consists of the following components:

- Photosensitive drum
- Developing unit
- Developing roller
- Primary-charging roller

The DC controller rotates the drum motor to drive the photosensitive drum, developing roller, and the primary-charging roller.

Figure 1-24 Print-cartridge system



The DC controller rotates the drum motor to drive the photosensitive drum, developing unit, and primary charging roller.

The memory tag is a non-volatile memory chip that stores information about the usage for the print cartridge. The product reads and writes the data in the memory tag.

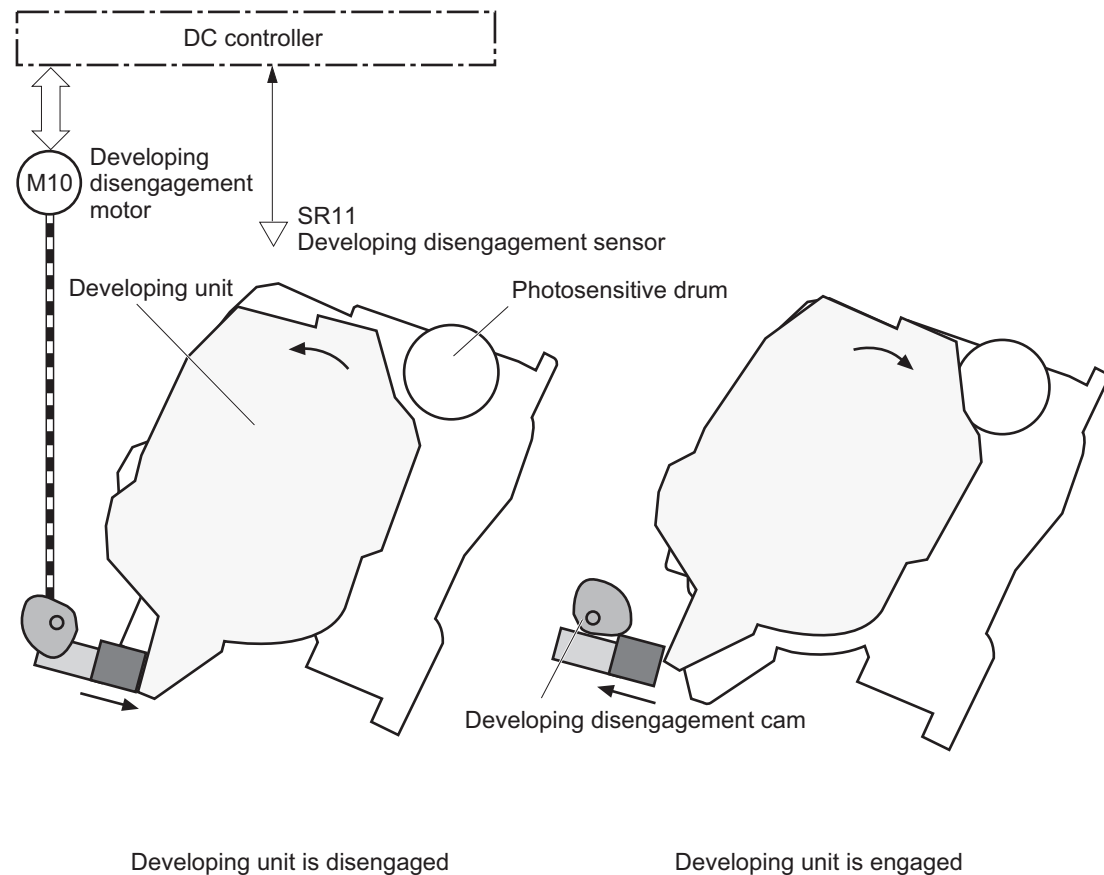
The DC controller determines a memory tag error and notifies the formatter when it fails to either read from or write to the memory tag.

- Cartridge presence detection: The DC controller detects the presence of the cartridges by monitoring the memory tag. The DC controller notifies the formatter when a cartridge is missing or installed in the incorrect slot.
- Toner level detection: The DC controller detects the remaining toner in a cartridge by the optical detection method and then notifies the formatter of the remaining toner level.
- Cartridge life detection: The DC controller detects the cartridge life by monitoring the total operating time or remaining toner level of the print cartridge. The DC controller determines a cartridge end of life and notifies the formatter when total operating time of the cartridge reaches a specified time or the cartridge runs out of toner.

Developing-roller engagement and disengagement

The product can print in full-color mode or in black-only mode. To print in black-only mode, the product disengages the developing rollers in the cyan, magenta, and yellow print cartridges which maximizes the life of the cartridges.

Figure 1-25 Developing-roller engagement and disengagement control



The developing-roller engagement and disengagement control operates as follows: When the product is turned on and when each print job is completed, all four of the developing units are disengaged from the photosensitive drums.

- The drive of the developing disengagement motor rotates the developing disengagement cam.
- As the cam rotates, the developing unit engages with or separates from the photosensitive drum.

When the print mode is full color, the developing units engage with the drums. When the print mode is black-only, only the black developing units engages with the drum.

The DC controller determines a developing disengagement motor failure and notifies the formatter when it does not detect a specified signal from the developing disengagement sensor during the developing unit engagement and disengagement operation.

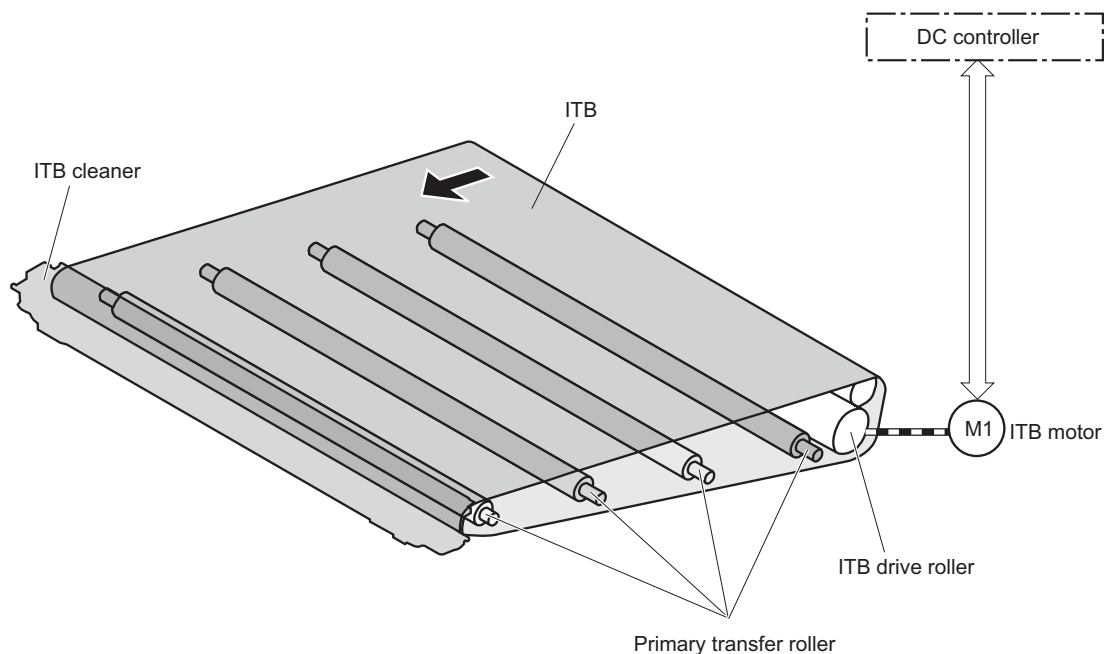
Intermediate transfer belt (ITB) unit

The ITB unit accepts the toner images from the photosensitive drums and transfers the completed image to the paper. The ITB unit has the following main components:

- ITB
- ITB drive roller
- ITB-drive roller
- Primary-transfer roller
- ITB cleaner

The ITB motor drives the ITB drive roller, which rotates the ITB. The motion of the ITB causes the primary transfer rollers to rotate. The ITB cleaner cleans the ITB surface.

Figure 1-26 ITB unit



Primary-transfer-roller engagement and disengagement

The sequence of the primary-transfer-roller engagement and disengagement control is as follows:

1. The fuser motor turns on the primary-transfer disengagement solenoid and rotates the primary-transfer-roller disengagement cam.
2. As the cam rotates, the Y/M/C primary-transfer-roller slide plate or the Bk primary-transfer-roller slide plate moves to the right or left, which causes the primary-transfer roller to move up or down.
3. The ITB engages with or separates from the photosensitive drum depending on the movement of the primary-transfer rollers.

Depending on the requirements of the print job, the primary-transfer rollers engage with the ITB so it can receive toner from the photosensitive drums. The primary-transfer roller has three engagement states.


Table 1-10 Primary-transfer-roller engagement states

All rollers disengaged	The ITB is disengaged from all the four photosensitive drums. This state is the home position for the ITB unit.
All rollers engaged	The ITB is engaged with all four photosensitive drums. The state for full-color printing.
Black roller engaged	The ITB is engaged with only the black photosensitive drum. The state for black-color mode printing .

The DC controller determines a primary-transfer-roller disengagement failure and notifies the formatter when it does not detect a signal from the primary-transfer disengagement sensor even though the primary-transfer disengagement solenoid is turned on.

If the DC controller does not receive the expected signal from the ITB home-position sensor when the primary-transfer-roller engages or disengages, but the primary-transfer-roller disengagement motor is rotating, the DC controller determines that the primary-transfer-disengagement mechanism has failed, and notifies the formatter.

The DC controller detects whether the ITB unit is new by monitoring the new ITB unit sensor. The DC controller determines the ITB unit is at end of life and notifies the formatter when a specified number of pages are printed after the ITB unit is replaced. If swapping ITB units between two products for troubleshooting purposes, be sure to return the ITB units to their original products to maintain the correct life count.

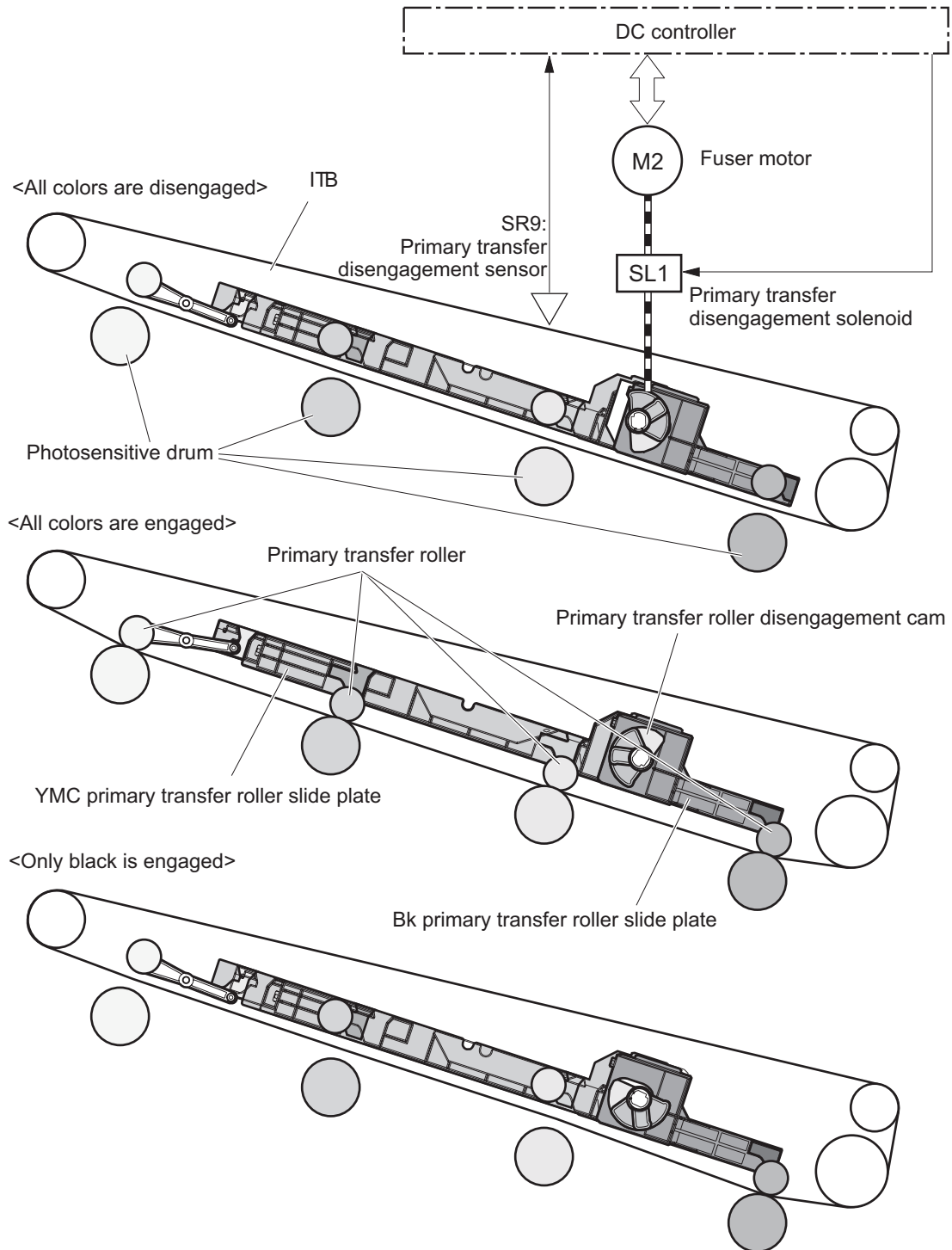
 **NOTE:** A new ITB has a flag that causes the ITB life counter to be reset. When an ITB is installed in the product, it cannot be removed and used again as a new ITB.

The DC controller detects the presence of an ITB unit by monitoring the primary-transfer-roller disengagement sensor. The DC controller turns on the primary-transfer disengagement solenoid for specified times during an initial rotation period when the following events occur:

- The product is turned on.
- The product exits sleep mode.
- The door is closed.

The DC controller determines the absence of an ITB unit and notifies the formatter when it does not detect a specified signal from the new primary transfer-roller disengagement sensor.

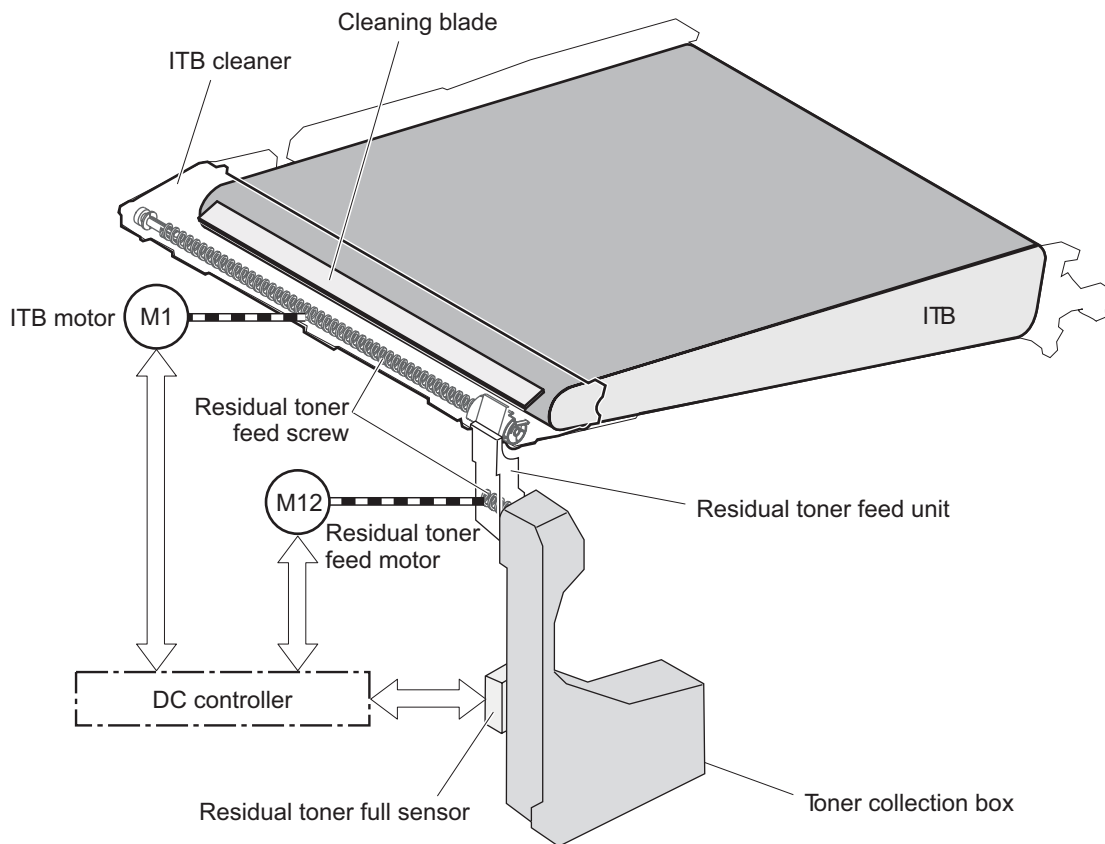
Figure 1-27 Three states of primary-transfer-roller engagement and disengagement



ITB cleaning

The cleaning blade in the ITB cleaner scrapes the residual toner off the ITB surface. The residual toner feed screw deposits the residual toner to the residual toner feed unit. The ITB motor and the residual toner feed motor drive the screw. The DC control detects whether the toner collection box is full, using the residual-toner full sensor, and then notifies the formatter.

Figure 1-28 ITB cleaning process



Calibration

The product calibrates itself to maintain excellent print quality. Calibration corrects color-misregistration and color-density variation.

During calibration, the product places a specific pattern of toner on the surface of the ITB. Sensors at the end of the ITB read the toner pattern to determine if adjustments are necessary.

NOTE: The product performs a drum-speed adjustment (DSA) during the full calibration operation. The DSA compensates for variations between each drum and the speed of the ITB surface.

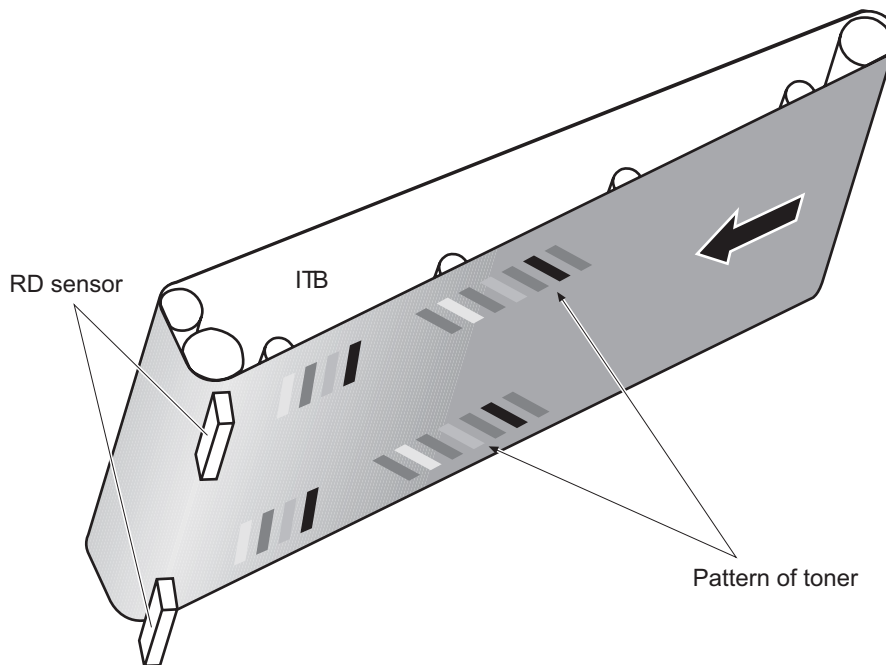
Color-misregistration control

Internal variations in the laser/scanners can cause the toner images to become misaligned. The color-misregistration control corrects the following problems:

- Horizontal scanning start position
- Horizontal scanning magnification
- Vertical scanning start position

The DC controller forms a pattern of toner on the surface of the ITB and measures a misaligned length with the RD sensor.

Figure 1-29 Toner patterns for calibration



The DC controller signals the formatter to perform the color-misregistration control when one of the following events occur:

- A cartridge or the ITB is replaced.
- A specified number of pages have printed.
- The formatter sends a command.

The DC controller determines an RD sensor failure and notifies the formatter if it detects data from the RD sensor that is not in a specified range, when the product is turned on or when the color-misregistration control starts.

Image-stabilization control



NOTE: The product contains a thermal sensor, located within the TCU level detection sensor, which monitors the temperature in the cartridge area and uses this information to make adjustments during CPR control.

Environmental changes or deterioration of the photosensitive drums and toner can cause variations in the image density. The image-stabilization control reduces these fluctuations.

Table 1-11 Image-stabilization controls

Image density control (DMAX)	<p>This control corrects variations in image density related to deterioration of the photosensitive drum or the toner. The DC controller adjusts the high-voltage biases to correct the problem under the following conditions:</p> <p>The image-stabilization control calibrates each high-voltage bias to stabilize the fluctuations in image density caused by deterioration of the photosensitive drums or toner or because of environmental changes. The DC controller determines the product's environment based on the surrounding temperature and humidity data from the environment sensor. The DC controller calibrates the biases according to the detected environment and usage condition of the print cartridge to obtain an appropriate image. The DC controller determines an environment sensor failure and notifies the formatter when it detects environmental data from the environment sensor with out of specified value. The DC controller commands the formatter to control the image density under the following conditions</p> <ul style="list-style-type: none">• The temperature of the main thermistor is too low when the product is turned on.• A print cartridge or the ITB is replaced.• A specified number of pages have printed.• After a specific period of the completion of a previous DMAX• The environment changes for a specified condition after a previous DMAX.
Image halftone control (DHALF)	<p>The formatter performs this control to calibrate the halftone, based on the halftone-density measurements, under the following conditions:</p> <ul style="list-style-type: none">• The formatter sends a command.• DMAX is completed. <p>The DC controller determines an RD sensor failure and notifies the formatter if it detects data from the RD sensor out of a specified range.</p>

The DC controller determines a RD sensor failure and notifies the formatter if it detects an out-of-specified-data value from the RD sensor when the product is turned on or when the color misregistration control starts.

Pickup, feed, and delivery system

The pickup, feed, and delivery system uses a series of rollers to move the paper through the product.

Figure 1-30 Paper path

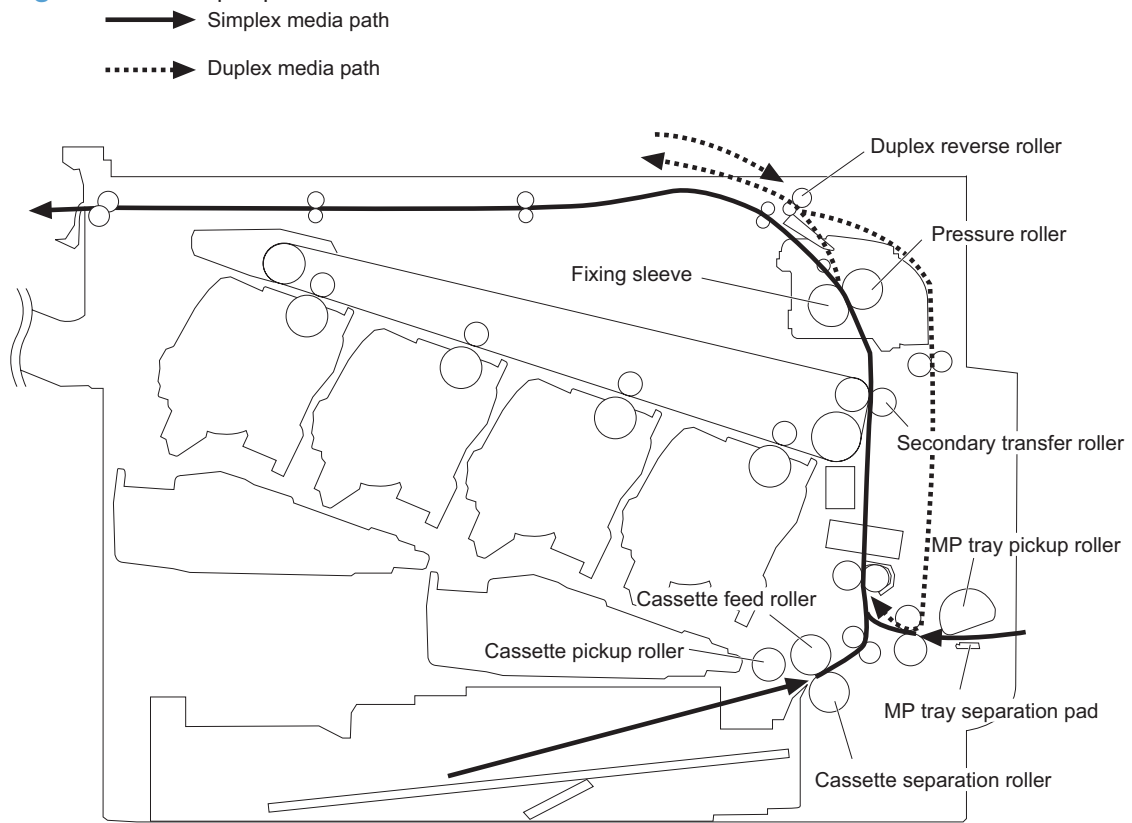
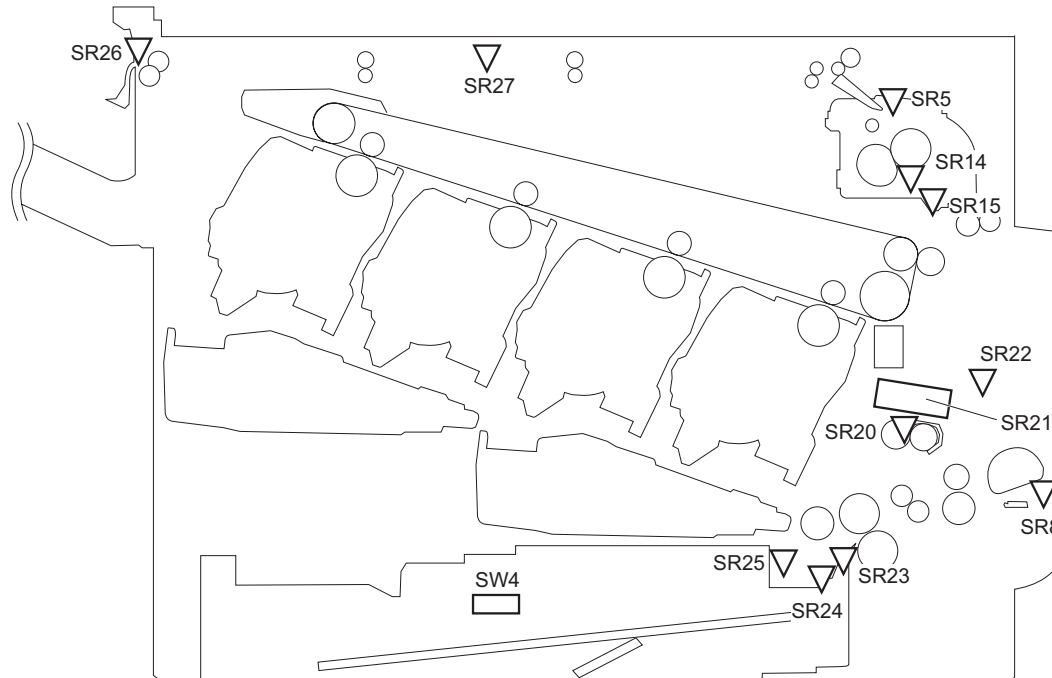
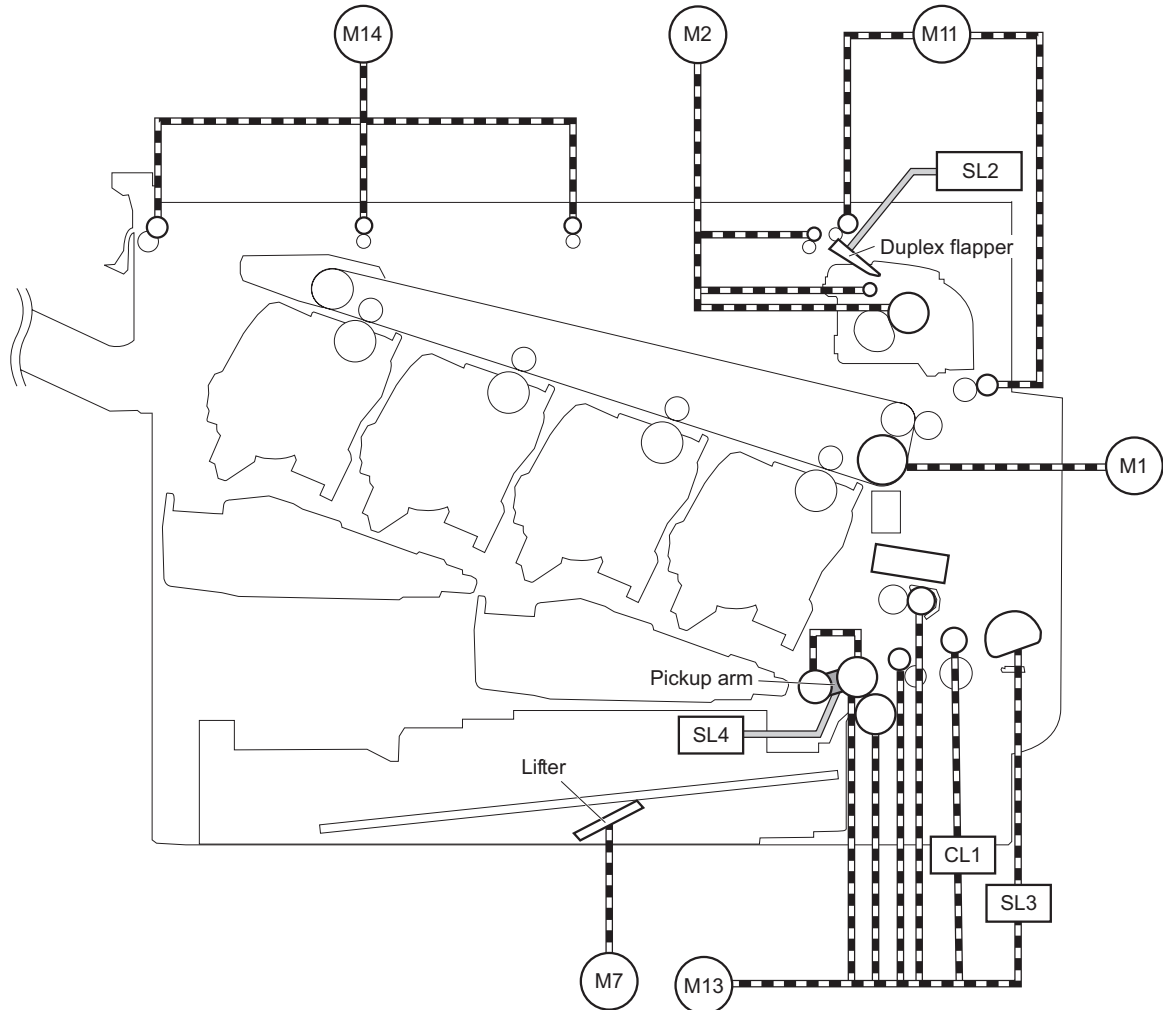


Figure 1-31 Switches and sensors for the pickup, feed, and delivery system



Abbreviation	Component
SR5	Fuser delivery sensor
SR8	MP tray media presence sensor
SR14	Loop sensor 1
SR15	Loop sensor 2
SR20	Top of page (TOP) sensor
SR21	Media sensor
SR22	Duplex re-pickup sensor
SR23	Cassette-media stack-surface sensor 1
SR24	Cassette-media stack-surface sensor 2
SR25	Cassette presence sensor
SR26	IPTU media full sensor
SR27	IPTU media feed sensor
SW4	Cassette media size switch

Figure 1-32 Motors and solenoids for the pickup, feed, and delivery system

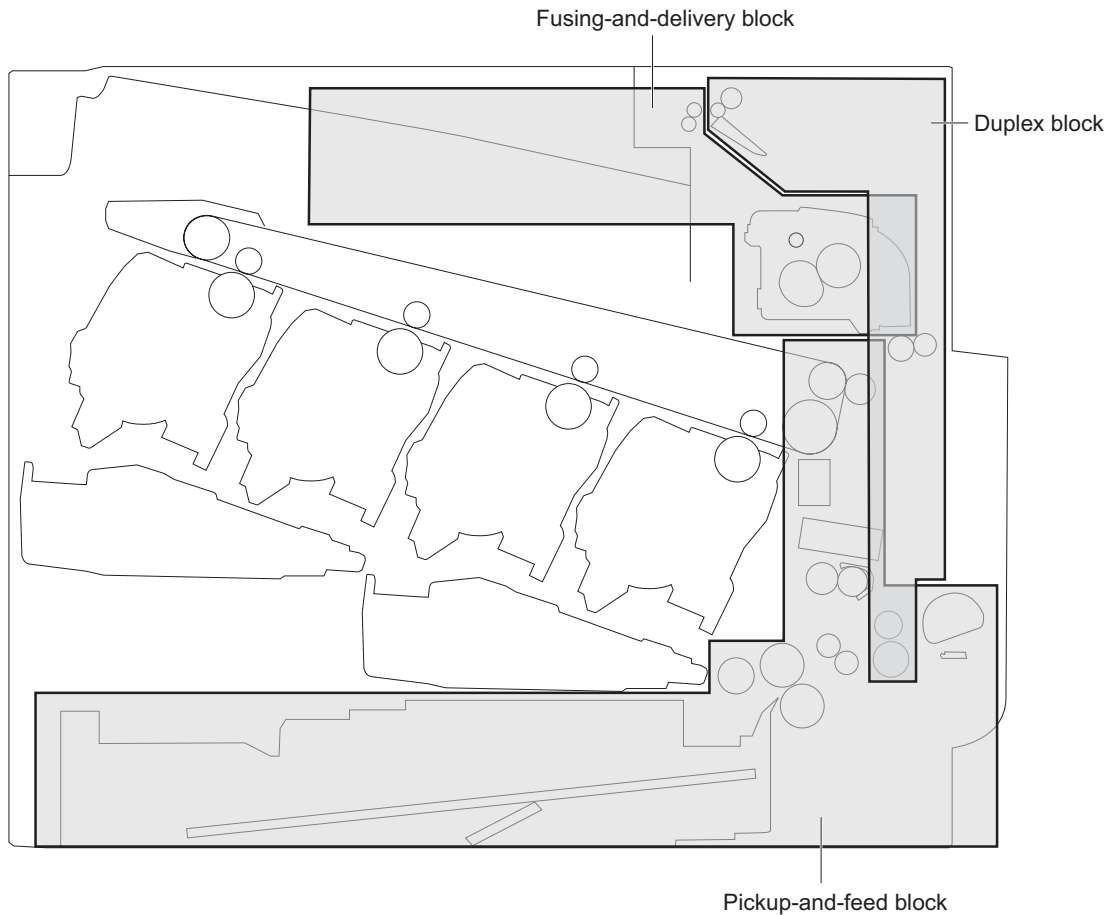


Abbreviation	Component
M1	ITB motor
M2	Fuser motor
M7	Lifter motor
M11	Duplex reverse motor
M13	Pickup motor
M14	IPTU feed motor
CL1	Duplex re-pickup clutch
SL2	Duplex reverse solenoid
SL3	Multipurpose tray pickup solenoid
SL4	Cassette pickup solenoid
CL1	Duplex re-pick clutch

The pickup, feed, and delivery system is divided into the following three blocks:

- Pickup-and-feed block: From each pickup source to the fuser inlet
- Fuser-and-delivery block: From the fuser to the delivery destination
- Duplex block: From the duplex reverse unit to duplex re-pickup unit (for duplex models only)

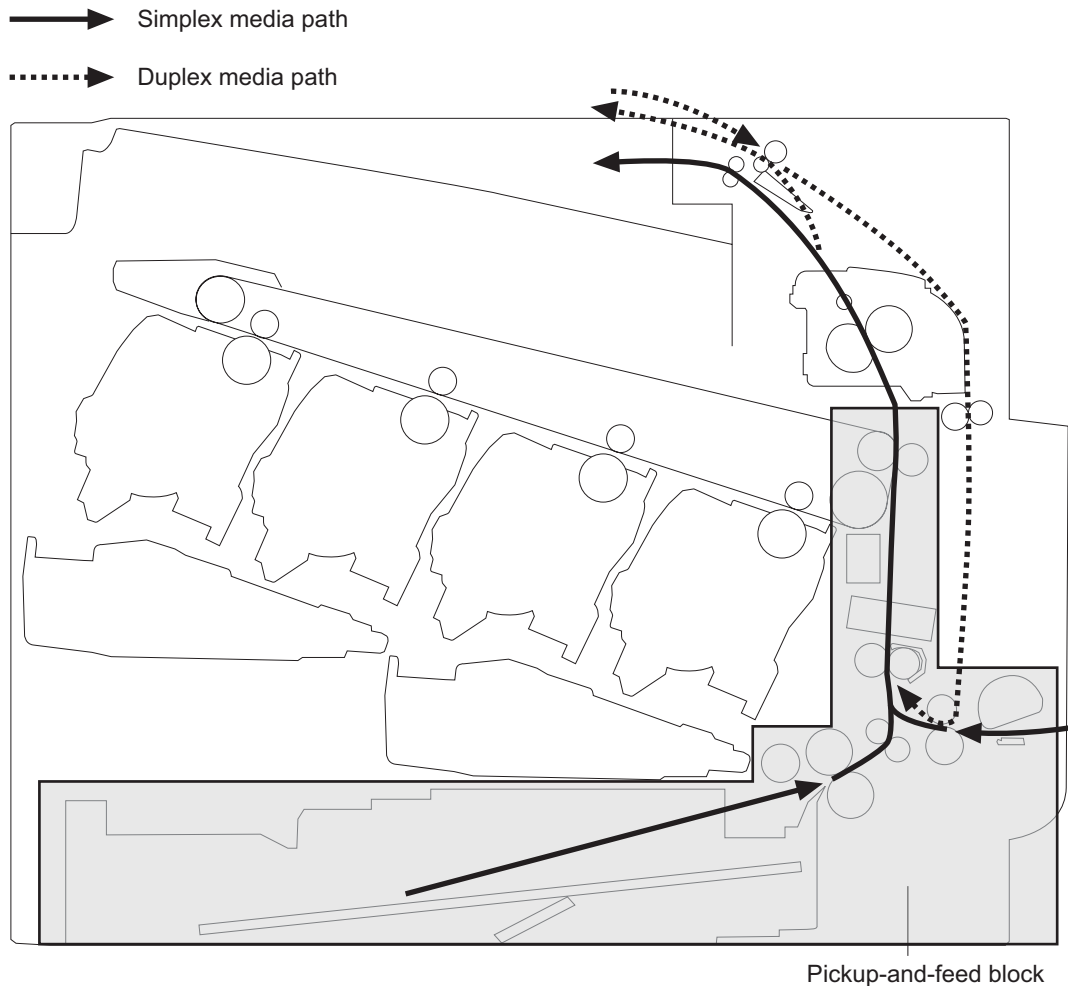
Figure 1-33 Three main units of the pickup, feed, and delivery system



Pickup-and-feed unit

The pickup-and-feed unit picks an individual sheet of paper from the multipurpose tray or the cassettes, carries it through the secondary-transfer unit, and feeds it into the fuser.

Figure 1-34 Pickup-and-feed unit



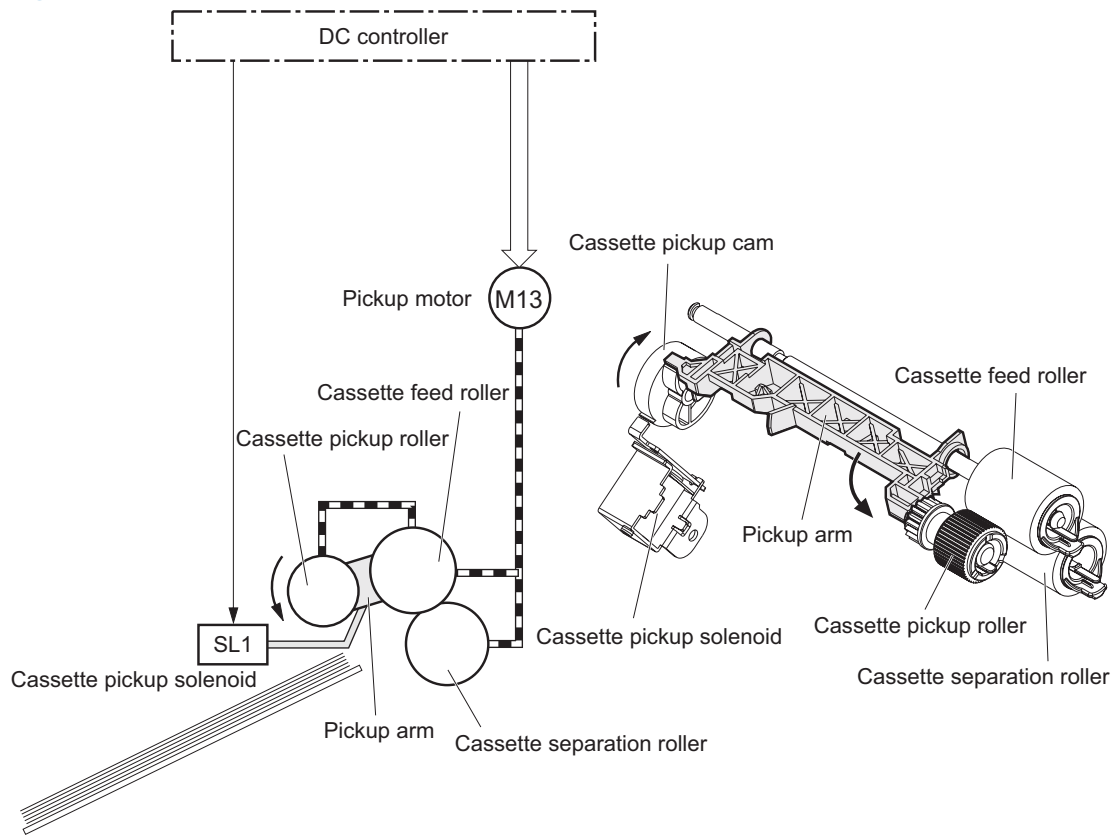
Cassette pickup

The sequence of steps for the cassette-tray pickup operation is the following:

1. The product is turned on or the cassette is inserted.
2. The cassette lift-up operation raises the lifting plate so paper can be picked up.
3. The pickup motor rotates when a print command is received from the formatter.
4. The cassette pickup roller, cassette feed roller, and cassette separation roller rotate.
5. The cassette pickup solenoid turns on at a specified time.
6. The cassette pickup cam rotates.

7. As the pickup arm lowers, the cassette pickup roller touches the surface of the paper stack.
8. One sheet of paper feeds into the product.

Figure 1-35 Cassette-pickup mechanism



Cassette-presence detection

The product detects the size of the paper loaded in the cassette and the presence of the cassette by monitoring the cassette media size switch. The DC controller notifies the formatter when it determines the absence of the cassette.

Paper size	Cassette media size switch		
	Top switch	Center switch	Bottom switch
Universal	ON	ON	ON
A5	OFF	OFF	ON
B5	OFF	ON	ON
Executive	ON	OFF	ON
Letter	OFF	ON	OFF
A4	ON	OFF	OFF

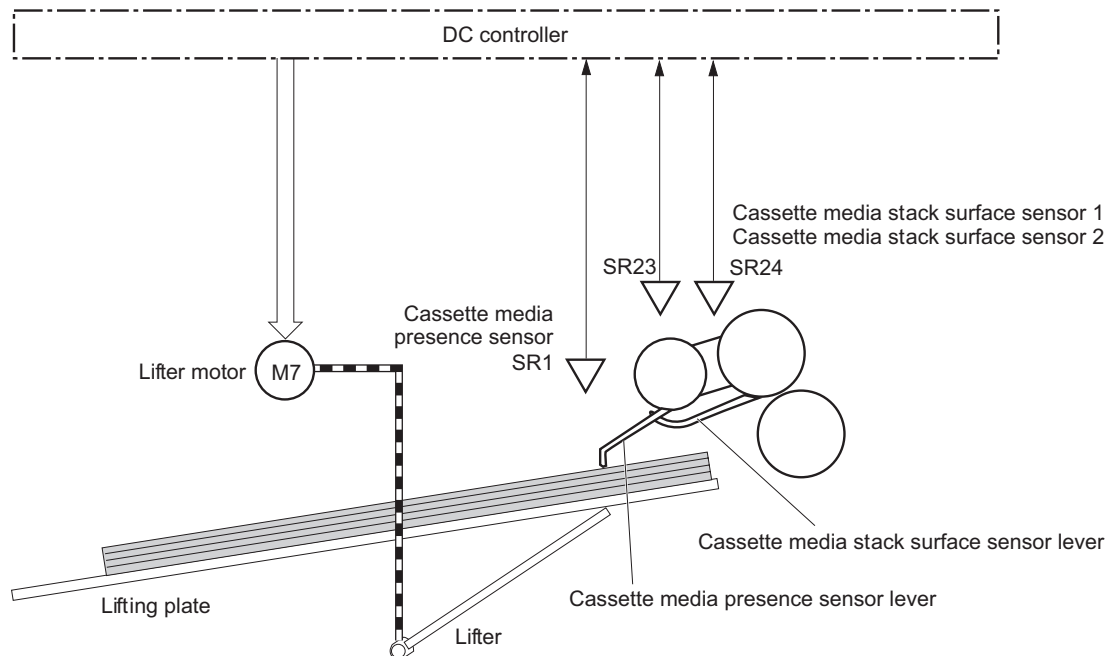
Paper size	Cassette media size switch		
	Top switch	Center switch	Bottom switch
Legal	ON	ON	OFF
Cassette absence	OFF	OFF	OFF

Cassette lift operation and cassette paper-presence detection

The product keeps the paper stack surface at the correct pickup position. The cassette lift-up operation is performed under the following conditions:

- The product is turned on
- The cassette is inserted
- The paper stack surface in the cassette lowers

Figure 1-36 Cassette lift mechanism



The operational sequence of the cassette lift-up is as follows:

1. The lifter motor rotates and the lifter moves up.
2. When the cassette-media stack surface sensor 2 detects the stack surface of media, the lifter motor stops.
3. The lifter motor rotates again to lift the lifter when the cassette-media stack surface sensor 1 detects the stack surface and then lowers during printing.

When a cassette-media stack surface sensors does not detect the stack surface within a specified time period after the lifter motor starts rotating, the DC controller determines a lifter motor failure and notifies the formatter

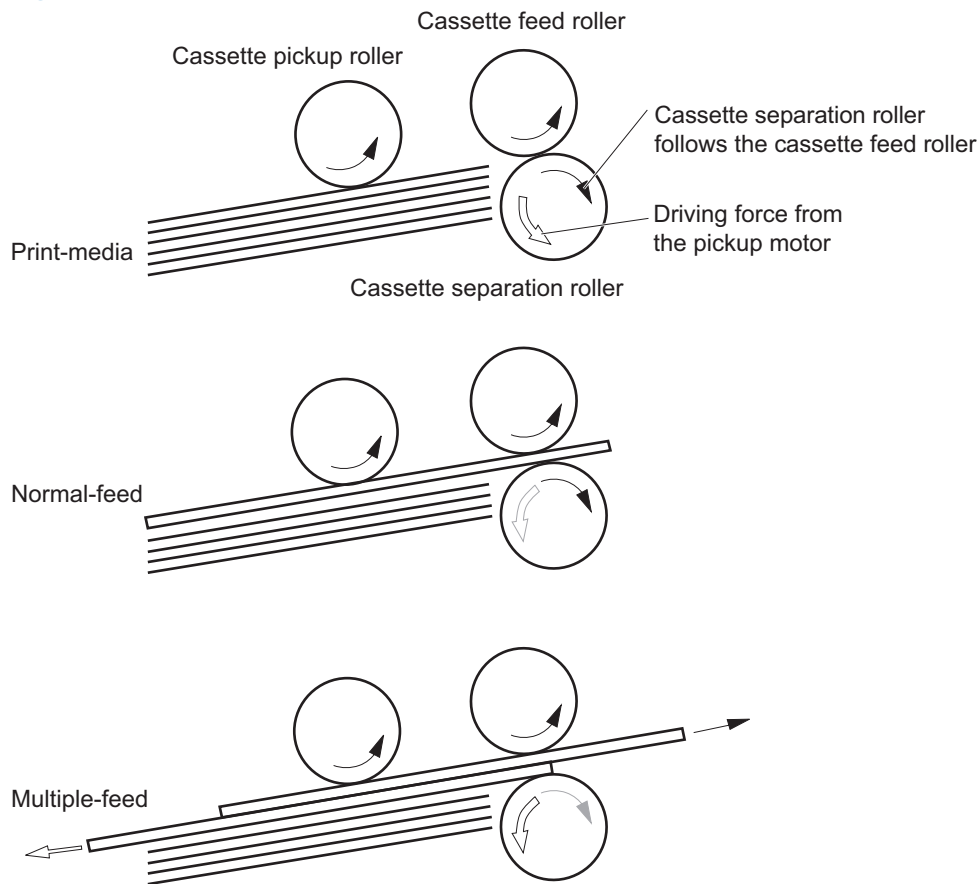
Cassette multiple-feed prevention

In the cassette, a separation roller prevents multiple sheets of paper from entering the paper path. The cassette pickup roller drives the separation roller through a sheet of paper.

The rotation of the cassette feed roller through the sheet drives the cassette separation roller. Because it is equipped with a torque limiter, only one sheet is fed into the product.

The low friction force between the sheets weakens the driving force from the cassette feed roller. Therefore, the separation roller is driven by its own driving force and holds back any multiple-fed sheets from the cassette.

Figure 1-37 Multiple-feed prevention



Multipurpose tray pickup

The product picks up one sheet of paper from the MP tray.

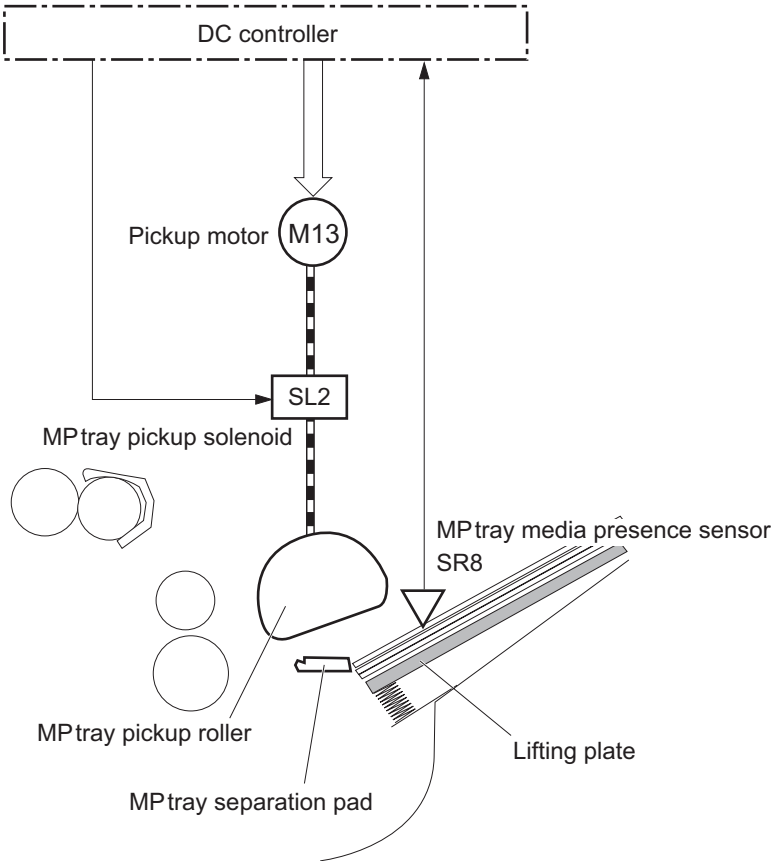
The sequence of steps for the multipurpose tray pickup operation as follows:

1. The pickup motor reverses when a print command is received from the formatter.
2. When the DC controller turns on the MP tray pickup solenoid, the MP tray pickup roller rotates and the lifting plate lifts.

3. As the lifting plate rises, the paper is picked up.
4. The multipurpose tray separation pad removes any multiple-fed sheets, and one sheet is fed into the product.

The MP-tray media-presence sensor (SR8) detects whether paper is present in the MP tray.

Figure 1-38 Multipurpose tray pickup mechanism



Paper feed

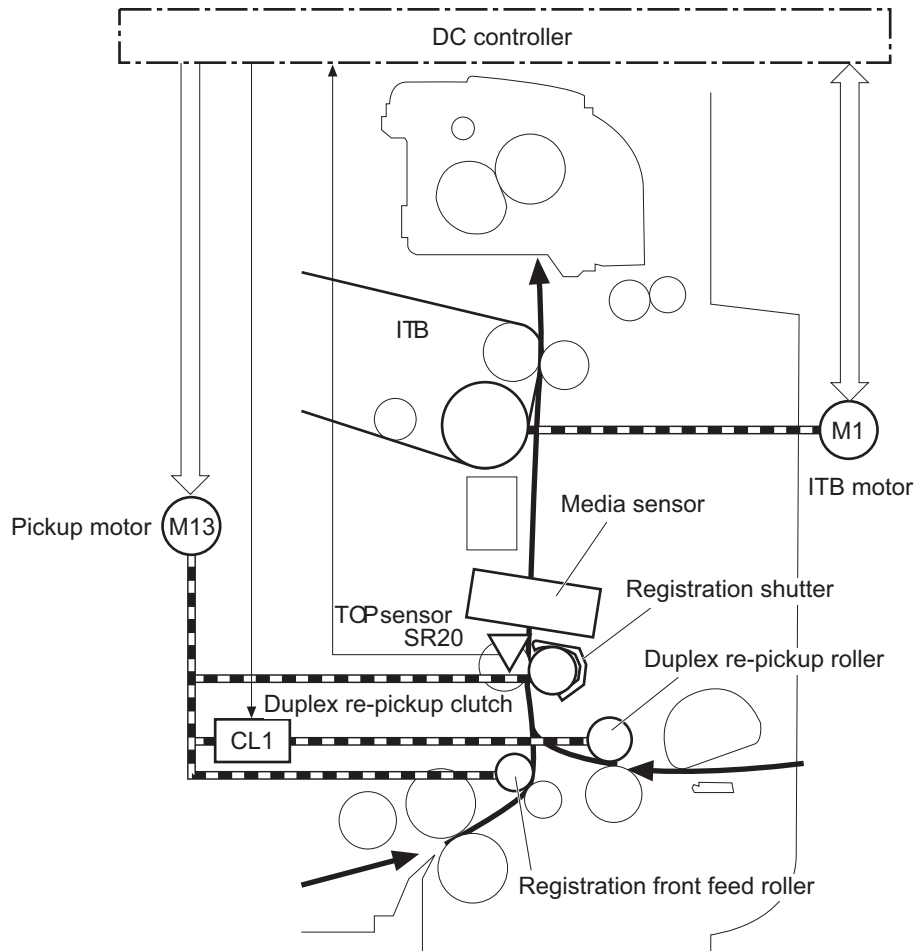
After the pickup operation, the paper feeds through the product and into the fuser.

1. The paper picked up from the cassette is fed to the registration unit as the pickup motor rotates. The paper picked up from the multipurpose tray is fed to the registration unit as the pickup motor rotates. The duplex model has the duplex feed clutch. The driving force of the pickup motor is transmitted to the duplex re-pickup roller by turning on the clutch.
2. The registration shutter corrects the skew-feed.
3. When the TOP sensor detects the leading edge of paper, the DC controller stops the paper so that the media sensor detects the type of paper.
4. The DC controller controls the rotational speed of the pickup motor to align the paper with the leading edge of the toner image on the ITB.

5. The ITB motor rotates the ITB.
6. The toner image on the ITB is transferred onto the paper, and the paper is fed to the fuser.

The DC controller notifies the formatter of a paper size mismatch error when the paper length detected by the TOP sensor does not match the paper size specified by the formatter.

Figure 1-39 Paper-feed mechanism

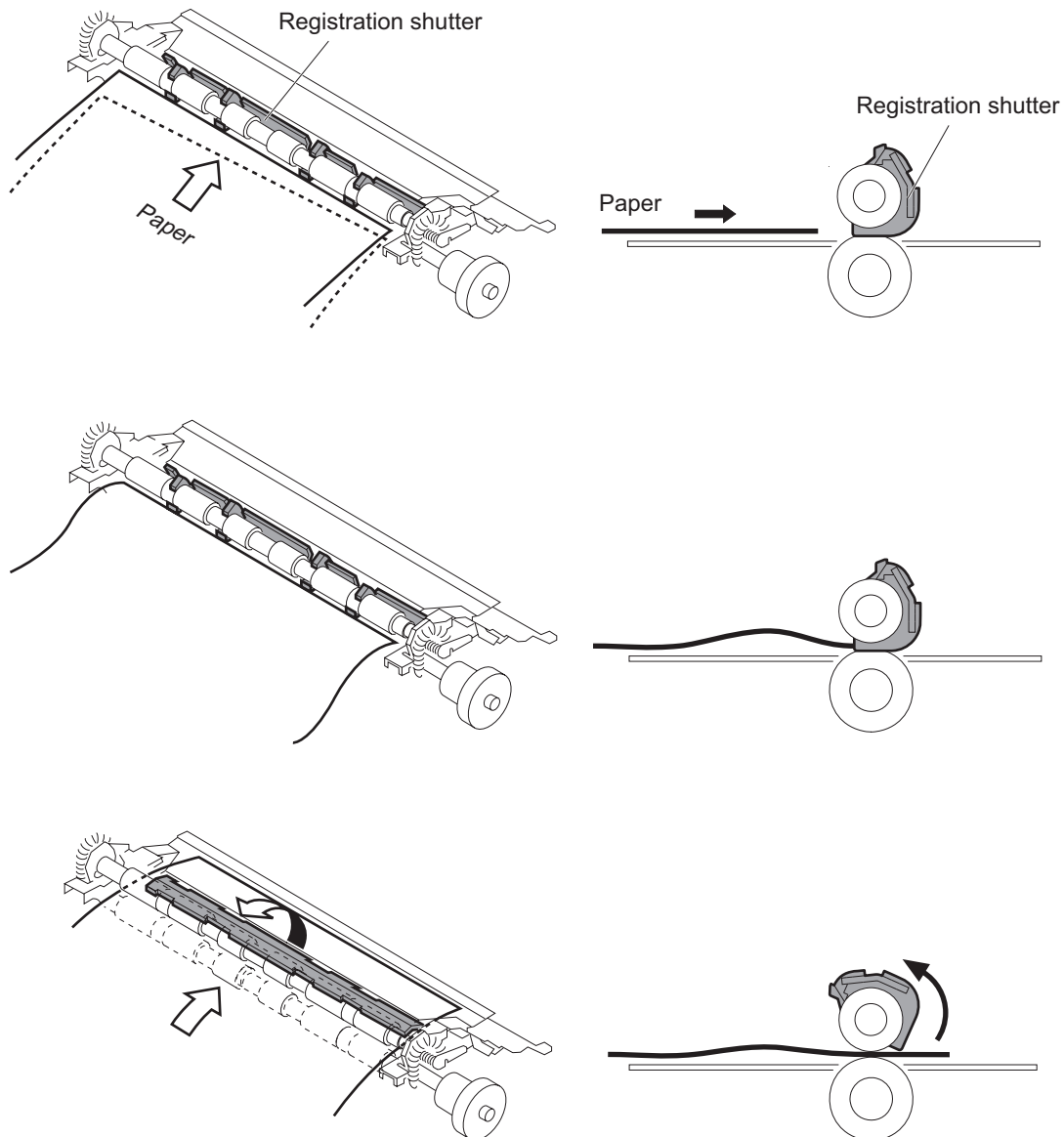


Skew-feed prevention

The product can straighten the paper without slowing the feed operation.

1. The leading edge of paper strikes the registration shutter, and the leading edge is aligned with the shutter.
2. As the feed rollers keep pushing the paper, the paper warps.
3. When the force is great enough, the registration shutter opens, and the paper passes through and straightens

Figure 1-40 Skew-feed prevention



Paper detection

The product detects the type of paper by monitoring the media sensor. The media sensor detects the glossiness of paper by the reflected light and the thickness of paper by transmitted light. The DC

controller identifies the type of paper (for example, plain paper, light paper, heavy paper, glossy paper, glossy film, or overhead transparency) and switches to the correct print mode. The DC controller determines a media mismatch error and notifies the formatter under the following condition:

Simplex printing

- The specified print mode is overhead transparency (OHT), but the media sensor detects another paper type.
- The specified print mode is not auto or OHT, but the media sensor detects OHT.

Duplex printing

- The media sensor detects OHT.

The DC controller flashes the media sensor during the initial rotation period under the following conditions:

- The product is turned on
- The product exits Sleep mode

When the light intensity is not a specified value, the DC controller determines a media-sensor failure and notifies the formatter.

Feed speed control

For the best print quality, the product adjusts the feed speed depending on the paper type.

Table 1-12 Print mode and feed speed

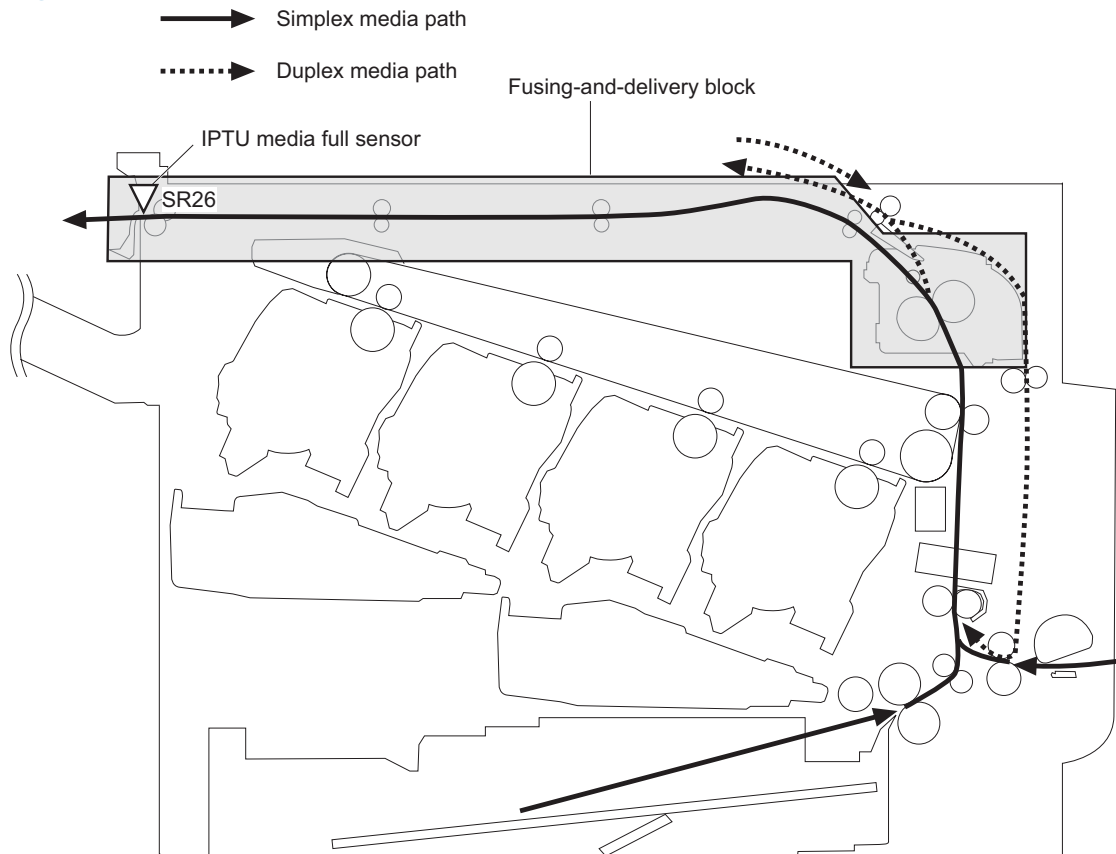
Print mode	Feed speed	Media sensor detection
Normal	1/1	Yes
Heavy media 1	3/4	
Heavy media 2	1/2	Yes
Heavy media 3	1/3	Yes
Light media 1	1/1	Yes
Glossy media 1	1/3	Yes
Glossy media 2	1/3	Yes
Glossy media 3	1/4	Yes
Glossy film	1/4	Yes
Envelope	1/2	No
OHT	1/4	Yes
Label	1/2	No
Designated media 1	1/2	No

Fusing and delivery unit

The fusing and delivery unit fuses the toner onto the paper and delivers the printed page into the output bin. The following controls ensure optimum print quality:

The face-down tray media full sensor on the output bin detects whether the tray is full of printed pages. The DC controller notifies the formatter when the sensor is on for a specified time.

Figure 1-41 Fuser and delivery unit



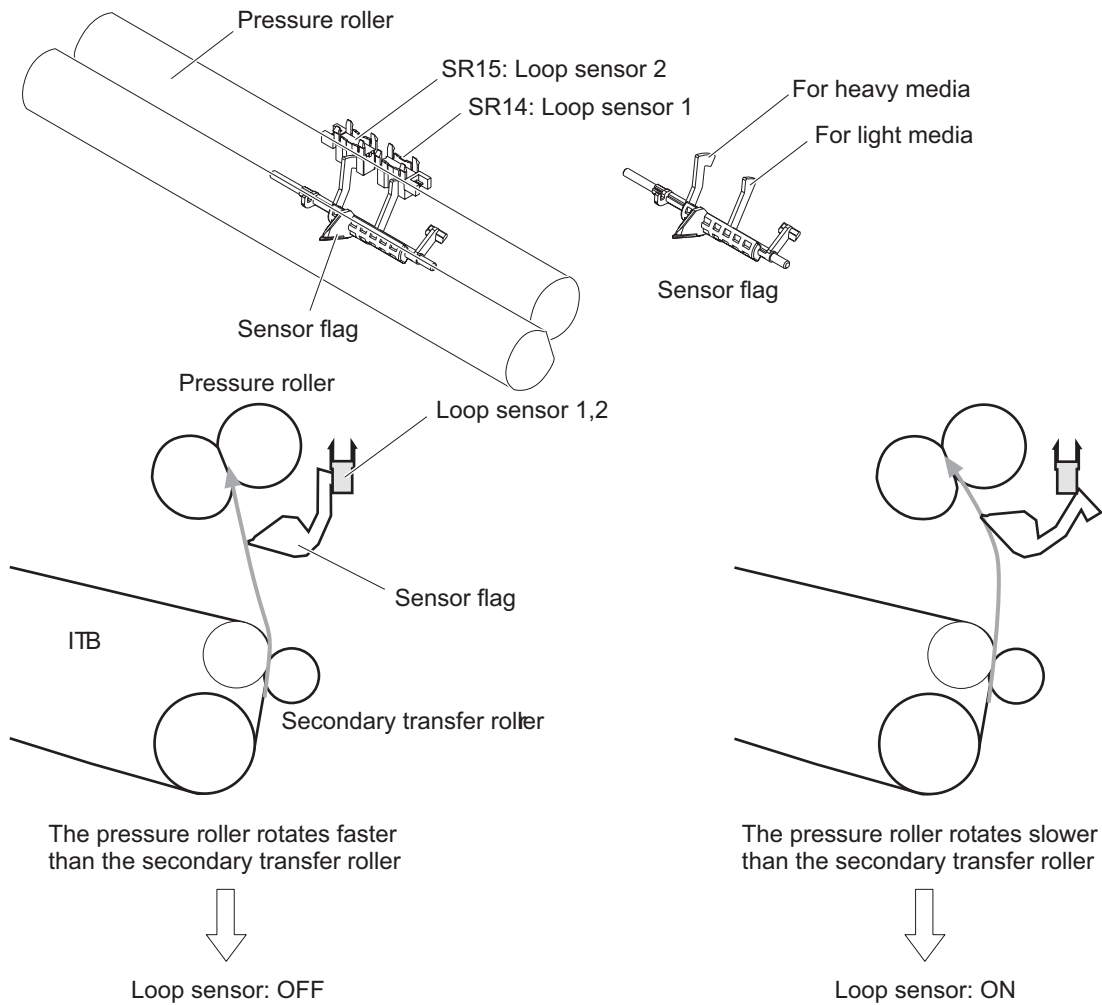
Loop control

The loop control stabilizes the paper feed operation before the paper enters the fuser. If the pressure roller rotate slower than the secondary transfer roller, the paper loop increases and an image defect or paper crease occurs. If the pressure roller rotate faster than the secondary transfer roller, the paper loop decreases and a vertical scanning magnification failure occurs because the pressure roller pulls the paper.

To prevent these problems, loop sensor 1 and loop sensor 2 detect the paper loop before the paper enters the fuser. The DC controller adjusts the rotational speed of the fuser motor according to the output signals from the loop sensors and maintains the paper loop. Loop sensor 1 is for light media,

and loop sensor 2 is for heavy media. The DC controller slows the fuser motor when the sensor is off and speeds up the sensor when the sensor is on.

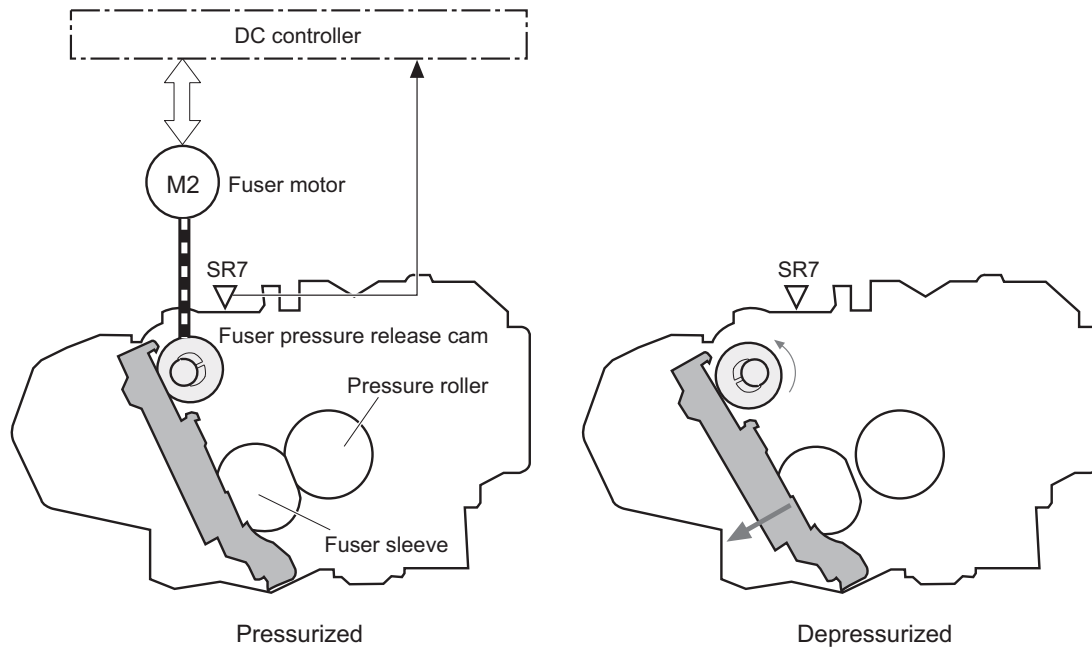
Figure 1-42 Loop-control mechanism



Pressure-roller pressurization control

To prevent excessive wear on the pressure roller and help with jam-clearing procedures, the pressure roller pressurizes only during printing and standby. The DC controller reverses the fuser motor. The fuser motor rotates the fuser pressure-release cam.

Figure 1-43 Pressure-roller pressurization control



The pressure roller depressurizes under the following conditions:

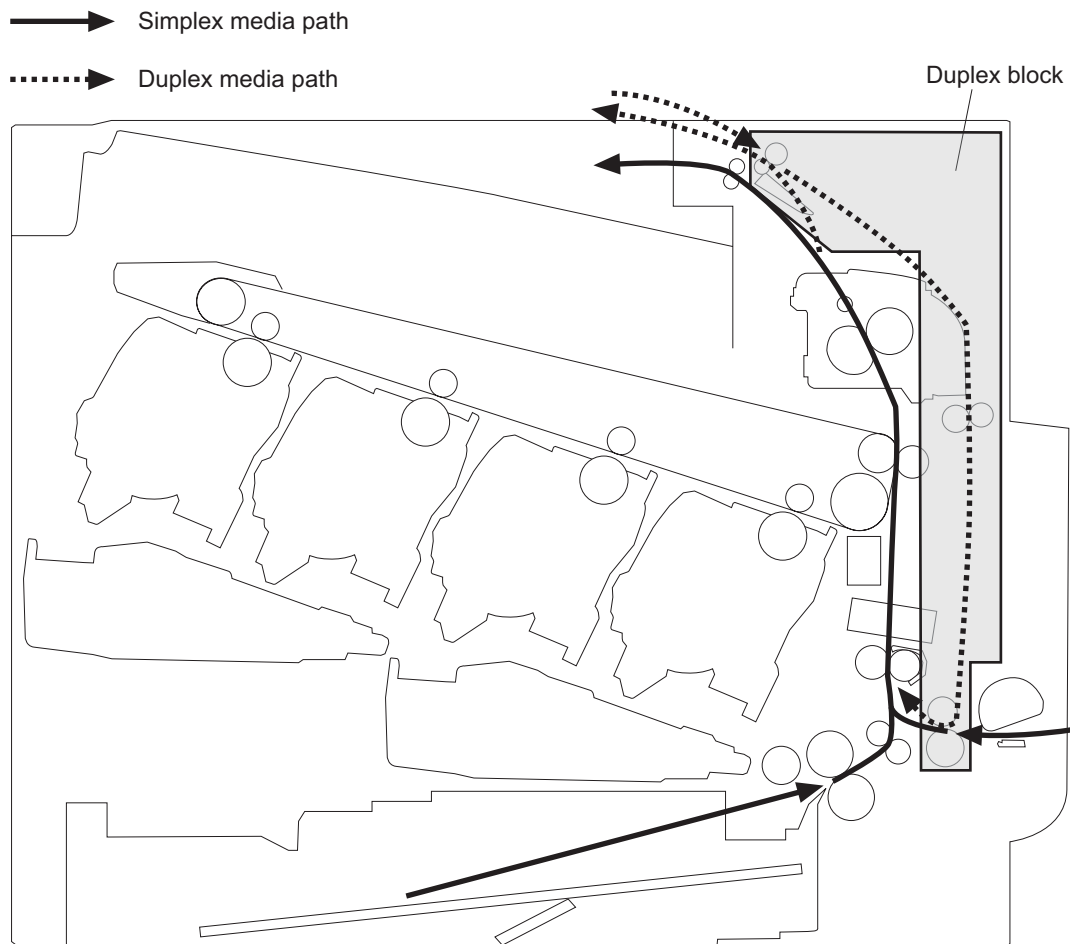
- The product is turned off
- Any failure occurs
- During powersave mode
- When a paper jam is detected

If the DC controller does not sense the fuser pressure-release sensor for a specified period after it reverses the fuser motor, it notifies the formatter that a fuser pressure-release mechanism failure has occurred.

Duplexing unit

The duplexing unit reverses the paper and feeds it through the paper path to print the second side.

Figure 1-44 Duplexing unit



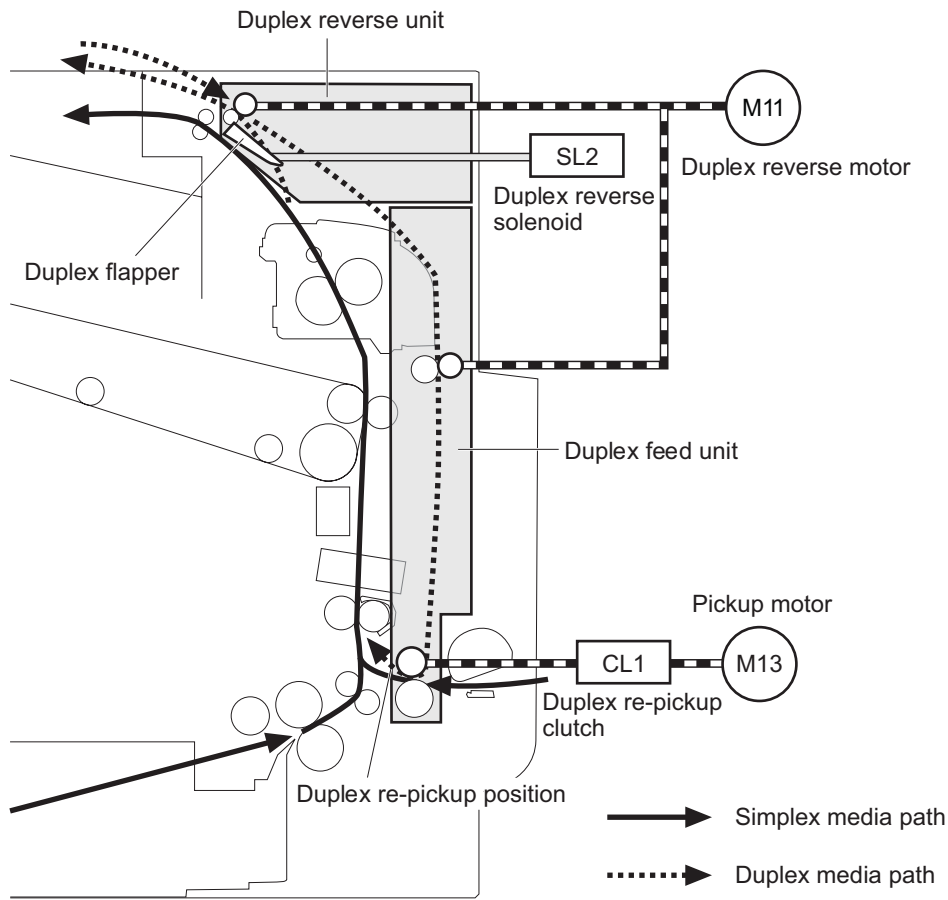
Duplexing reverse and feed control

The duplex reverse control reverses the paper after the first side is printed and feeds it to the duplex re-pickup position to print the second side of the page.

1. At a specified time after the first side of a page is printed, the duplex reverse motor rotates, and the duplex reverse solenoid is turned on.
2. The duplex flapper moves, and the paper is fed to the duplex reverse unit.
3. After a specified period of time, the duplex reverse motor is reversed, and the paper is fed to the duplex feed unit.
4. The duplex reverse motor and the pickup motor move the paper to the duplex re-pickup position.

5. The duplex reverse motor and the duplex feed clutch stop, and the paper feed operation pauses.
6. After a specified period of time, the duplex reverse motor rotates, and the duplex feed clutch is turned on. The paper is then picked up again.

Figure 1-45 Duplex reverse and feed control



Duplex print operation

The product has the following two duplex-media-feed modes depending on the paper sizes:

- One-sheet mode: Prints one sheet that is printed on two sides in one duplex print operation
- Two-sheet mode: Prints two sheets that are printed on two-sides in one duplex print operation

Table 1-13 Paper sizes

Paper size	Duplex media feed mode
A4	One-sheet operation
Letter	Two-sheet operation
B5	
Executive	
Legal	One-sheet operation

The formatter specifies the duplex-media-feed mode for each two-sided print job. Duplex printable media size (A4, Letter, B5, Legal and Executive) and designated print mode (Auto, Normal, Heavy media 1, Heavy media 2 (120 g/m² or lighter), Glossy media 1, Glossy media 2, Glossy media 3, Glossy film, Designated media 1, and Designated media 2) must be specified.

Jam detection

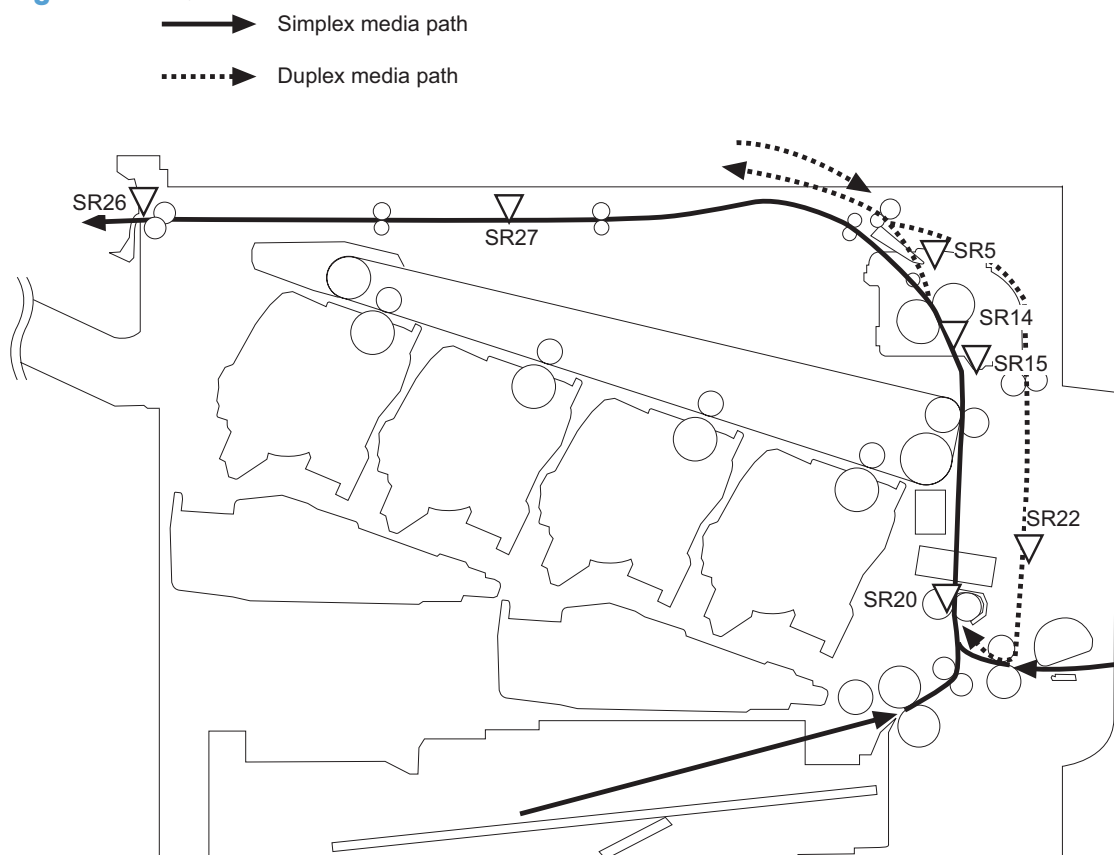
The product uses the following sensors to detect the paper as it moves through the paper path and to report to the DC controller if the paper has jammed.

- Fuser delivery sensor (SR5)
- Top of page (TOP) sensor (SR20)
- Loop sensor 1 (SR14)
- Loop sensor 2 (SR15)
- Duplex re-pickup sensor (SR22)
- IPTU media full sensor (SR26)

 **NOTE:** SR26 sensor is not used on products that have a stapling mailbox installed.

- IPTU media feed sensor (SR27)

Figure 1-46 Jam detection sensors



The product determines that a jam has occurred if one of these sensors detects paper at an inappropriate time. The DC controller stops the print operation and notifies the formatter.

Table 1-14 Jams that the product detects

Jam	Description
Pickup delay jam	The TOP sensor does not detect the leading edge of the paper within a specified time (including two retries) after the pickup operation from the cassette, multipurpose tray, or optional paper feeder starts.
Pickup stationary jam	The TOP sensor does not detect the trailing edge of the paper within a specified time from when it detects the leading edge.
Fuser delivery delay jam	The fuser delivery sensor does not detect the leading edge of the paper within a specified period after the TOP sensor detects the leading edge.
Fuser delivery stationary jam	The fuser delivery sensor does not detect the trailing edge of the paper within a specified period after it detects the leading edge.
Wrapping jam	After detecting the leading edge of the paper, the fuser delivery sensor detects the absence of paper, and it has not yet detected the trailing edge.
Residual paper jam	<p>One of the following sensors detects paper presence during the initialization sequence:</p> <ul style="list-style-type: none"> • Fuser delivery sensor • Loop sensor 1 • Loop sensor 2 <p>One of the following sensors detects paper presence during the an automatic delivery operation:</p> <ul style="list-style-type: none"> • Fuser delivery sensor • TOP sensor • Loop sensor 1 • Loop sensor 2 • Duplex re-pickup sensor • IPTU media feed sensor
Door open jam	A door is open while paper is moving through the product.
Duplexing re-pickup jam 1	The duplex re-pickup sensor does not detect the leading edge of the paper within a specified period after the media reverse operation starts in the duplex reverse unit.
Duplexing re-pickup jam 2	The TOP sensor does not detect the leading edge of the paper within a specified period after the paper is re-picked.
IPTU delivery delay jam 1	The IPTU media feed sensor does not detect the leading edge of paper within a specified time period after the fusing delivery sensor detects the leading edge.
IPTU delivery delay jam 2	The IPTU media full sensor does not detect the leading edge of paper within a specified period after the IPTU media feed sensor detects the leading edge.

Table 1-14 Jams that the product detects (continued)

Jam	Description
IPTU delivery stationary jam 1	The IPTU media feed sensor does not detect the trailing edge of paper within a specified period after it detects the leading edge.
IPTU delivery stationary jam 2	The IPTU media feed sensor detects a paper absence yet it does not detect the trailing edge of paper after it detects the leading edge.

Automatic delivery: The product automatically clears paper if the TOP sensor, duplex re-pickup sensor, IPTU media feed sensor, or PD media feed sensors detect residual paper during initialization.

Optional paper feeders

Three types of optional paper feeders are available for the product:

- 1 x 500 sheet paper feeder
- 1 x 500 sheet paper feeder and cabinet
- 3 x 500 paper feeder and stand

The operational sequence of the paper feeders is controlled by the paper feeder controller.

Figure 1-47 1 x 500 optional paper feeder

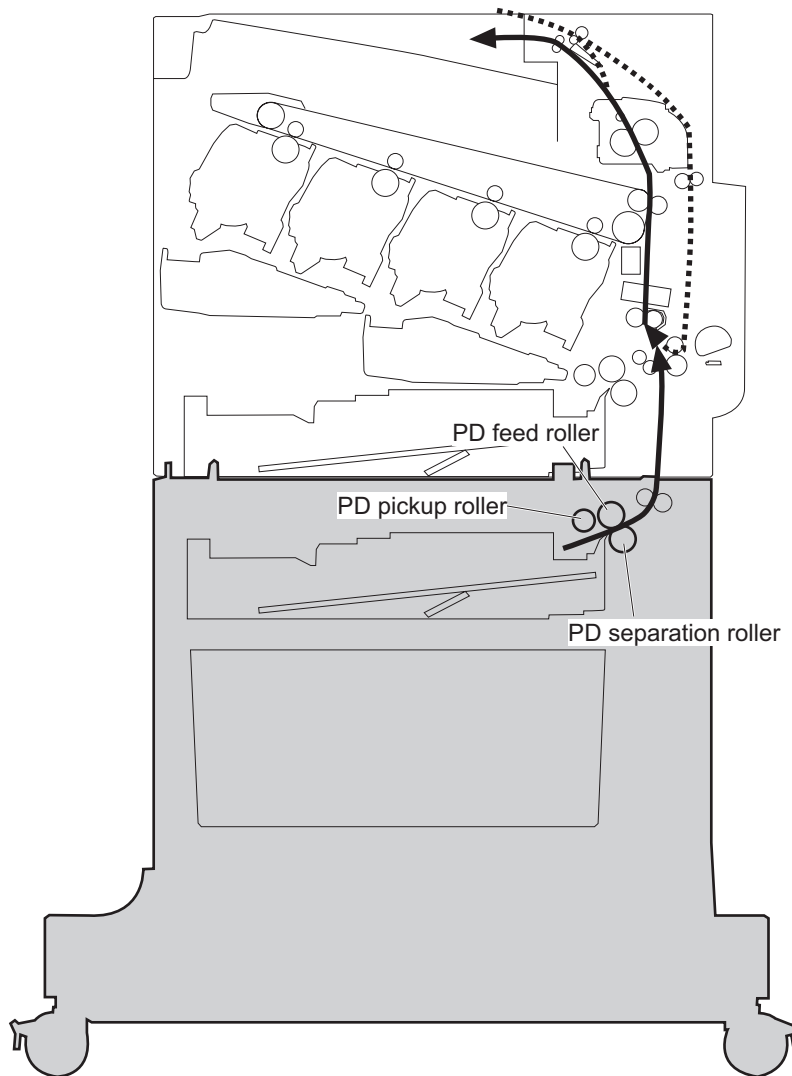


Figure 1-48 3 x 500-sheet optional paper feeder

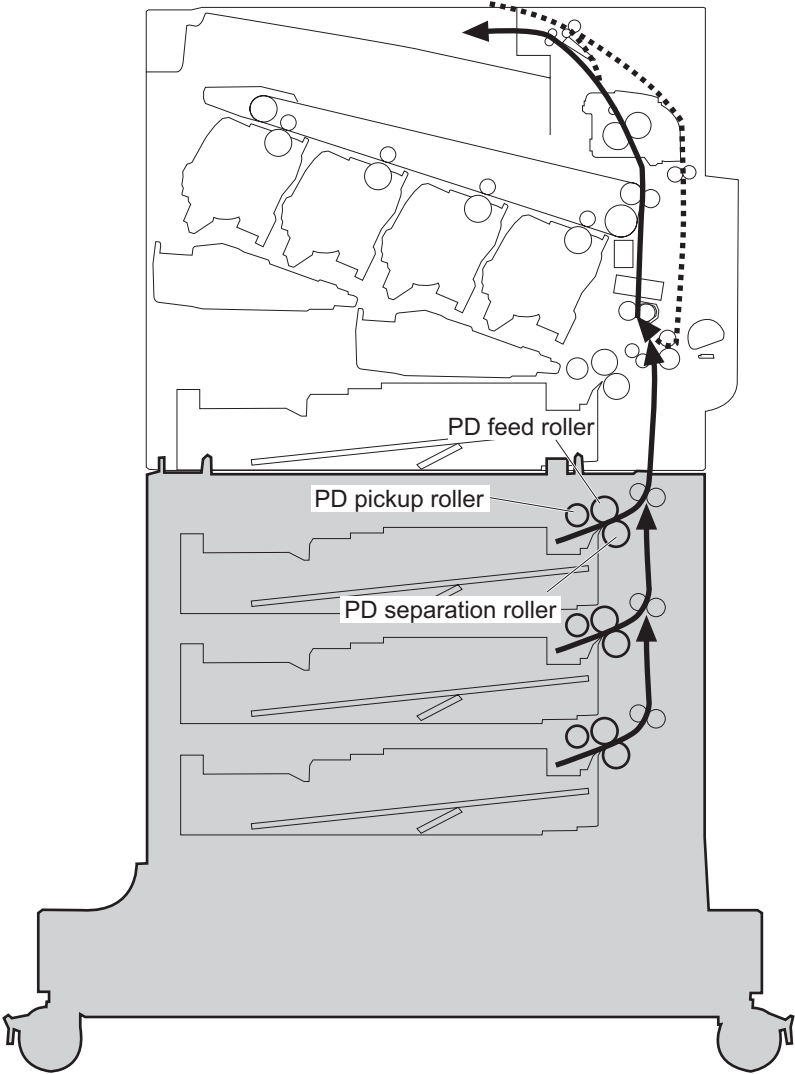
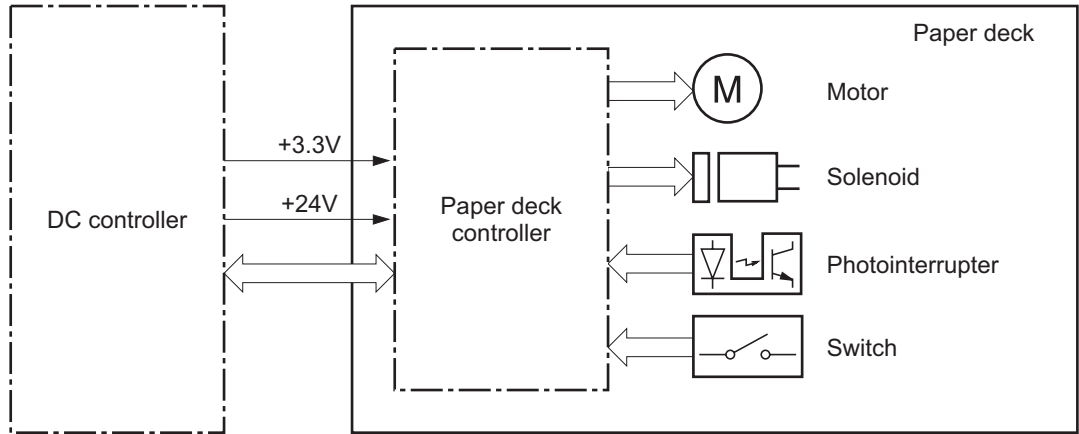


Figure 1-49 Signals for the paper feeder



The input trays contain several motors, solenoids, sensors, and switches, as described in the following table.

Table 1-15 Electrical components for the paper feeder

Component type	Abbreviation	Component name
Motors	M1	PD lifter motor 1
	M2	PD pickup motor
	M3	PD lifter motor 2 (3 x 500-sheet paper feeder only)
	M4	PD lifter motor 3 (3 x 500-sheet paper feeder only)
Solenoids	SL1	PD pickup solenoid 1
	SL2	PD pickup solenoid 2 (3 x 500-sheet paper feeder only)
	SL3	PD pickup solenoid 3 (3 x 500-sheet paper feeder only)
Sensors	SR1	Tray 3 paper surface sensor 1
	SR2	Tray 3 paper surface sensor 2
	SR3	Tray 3 paper present presence sensor
	SR4	Tray 3 feed sensor
	SR5	Tray 4 paper surface sensor 1 (3 x 500-sheet paper feeder only)
	SR6	Tray 4 paper present sensor (3 x 500-sheet paper feeder only)
	SR7	Tray 4 feed sensor (3 x 500-sheet paper feeder only)
	SR8	Tray 4 paper surface sensor 2 (3 x 500-sheet paper feeder only)
	SR9	Tray 5 paper surface sensor 1 (3 x 500-sheet paper feeder only)
	SR10	Tray 5 feed sensor (3 x 500-sheet paper feeder only)
	SR11	Tray 5 paper present sensor (3 x 500-sheet paper feeder only)
	SR12	Tray 5 paper surface sensor 2 (3 x 500-sheet paper feeder only)
Switches	SW1	PD right door switch
	SW2	PD media size switch 1 (3 x 500-sheet paper feeder only)
	SW3	PD media size switch 2 (3 x 500-sheet paper feeder only)
	SW4	PD media size switch 3 (3 x 500-sheet paper feeder only)

Motor control

The 1 x 500-sheet paper feeder has two motors, and the 3 x 500-sheet paper feeder has four motors for feeding paper.

Component		Drives	Failure detection
PD lifter motor 1	M1	Lifter of the upper cassette	No

Component	Drives		Failure detection
PD lifter motor 2 (3 x 500-sheet paper feeder only)	M3	Lifter of the middle cassette	No
PD lifter motor 3 (3 x 500-sheet paper feeder only)	M4	Lifter of the lower cassette	No
PD pickup motor	M2	PD pickup roller, PD feed roller, and PD separation roller	No

Paper-feeder pickup and feed operation

The paper feeder picks up one sheet from the paper-feeder cassette and feeds it to the product.

Figure 1-50 Paper-feeder pickup and feed operation

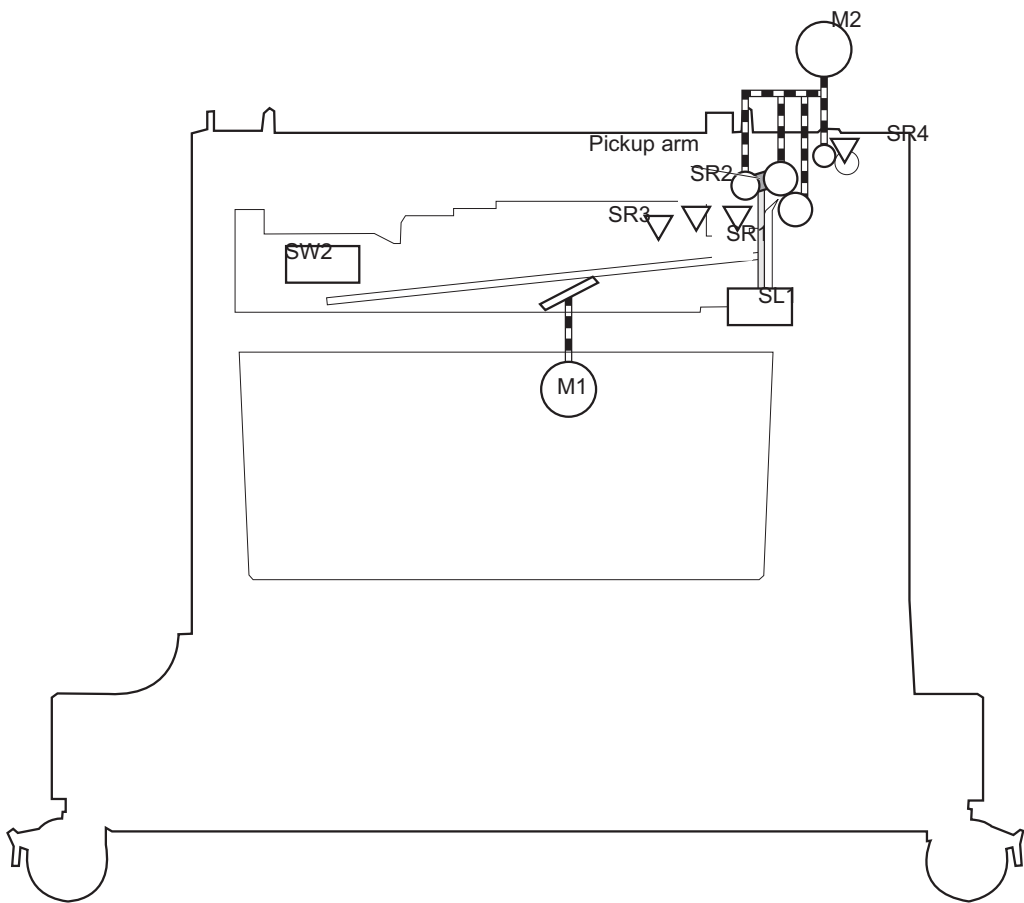
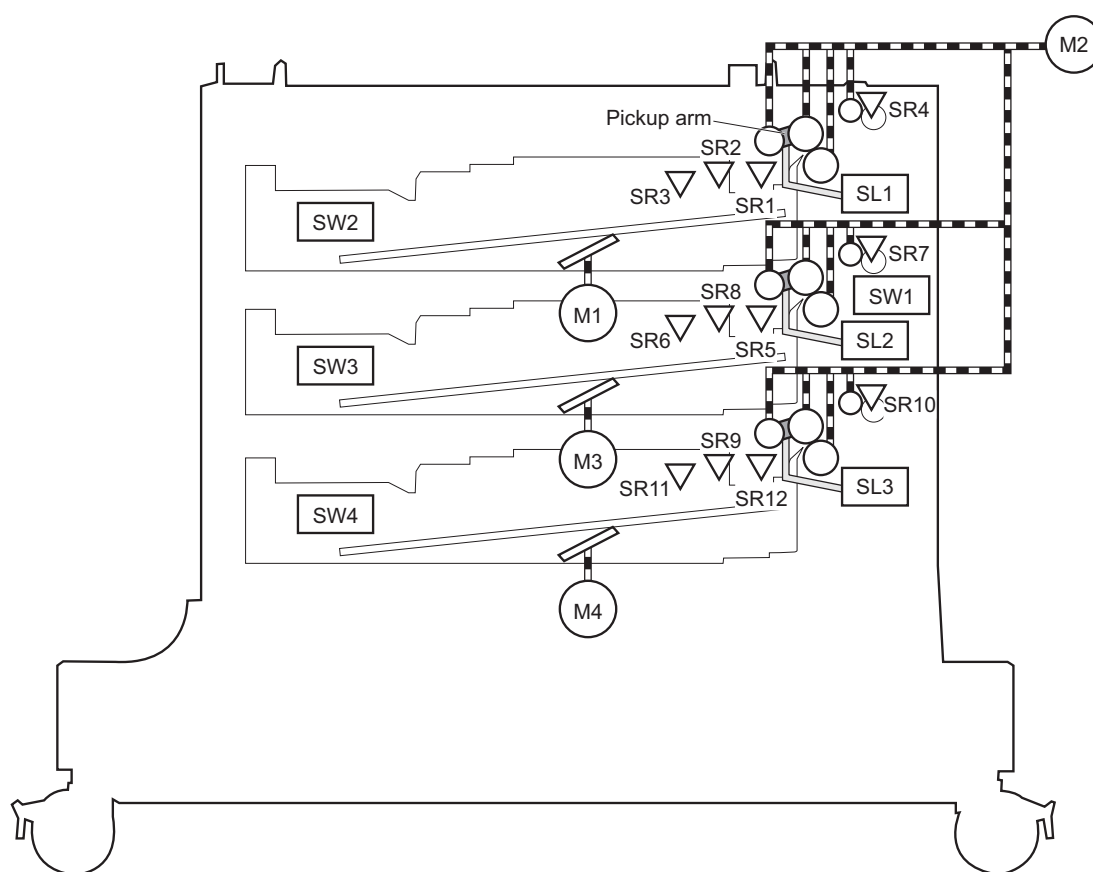


Table 1-16 Pickup feed components (1 x 500-sheet paper feeder)

Component	
M1	PD lifter motor 1
M2	PD pickup motor

Table 1-16 Pickup feed components (1 x 500-sheet paper feeder) (continued)

Component	
SL1	PD pickup solenoid 1
SR1	Tray 3 paper surface sensor 1
SR2	Tray 3 paper surface sensor 2
SR3	Tray 3 paper presence sensor
SR4	Tray 3 paper present sensor
SW2	Tray 3 paper size switches



Components	
M1	PD lifter motor 1
M2	PD pickup motor
M3	PD lifter motor 2 (3 x 500-sheet paper feeder only)
M4	PD lifter motor 3 (3 x 500-sheet paper feeder only)
SL1	PD pickup solenoid 1
SL2	PD pickup solenoid 2

SL3	PD pickup solenoid 3
SR1	Tray 3 paper surface sensor 1
SR2	Tray 3 paper surface sensor 2
SR3	Tray 3 paper presence sensor
SR4	Tray 3 paper presence sensor
SR5	Tray 4 paper surface sensor 1 (3 x 500-sheet paper feeder only)
SR6	Tray 4 paper surface sensor 2 (3 x 500-sheet paper feeder only)
SR7	Tray 4 feed sensor (3 x 500-sheet paper feeder only)
SR8	Tray 4 media-stack-surface sensor (3 x 500-sheet paper feeder only)
SR9	Tray 5 paper surface sensor 1 (3 x 500-sheet paper feeder only)
SR10	Tray 5 feed sensor (3 x 500-sheet paper feeder only)
SR11	Tray 5 paper present sensor (3 x 500-sheet paper feeder only)
SR12	Tray 5 media-stack-surface sensor (3 x 500-sheet paper feeder only)
SW1	Tray 3, 4, and 5 right door switch
SW2	Tray 3 paper size switches (3 x 500-sheet paper feeder only)
SW3	Tray 4 paper size switches (3 x 500-sheet paper feeder only)
SW4	Tray 5 paper size switches (3 x 500-sheet paper feeder only)

Paper-size detection and cassette-presence detection

The paper feeder detects the size of paper loaded in the paper feeder and the presence of the cassette using the PD media size switch.

Paper size	Paper-feeder cassette media-size switch settings		
	Top switch	Center switch	Bottom switch
Universal	On	On	On
A5	Off	Off	On
B5	Off	On	On
Executive	On	Off	On
Letter	Off	On	Off
A4	On	Off	Off
Legal	On	On	Off
No cassette	Off	Off	Off

Paper-feeder cassette lift operation

The paper feeder keeps the paper stack surface at the correct pickup position. The cassette lift operation occurs under the following conditions:

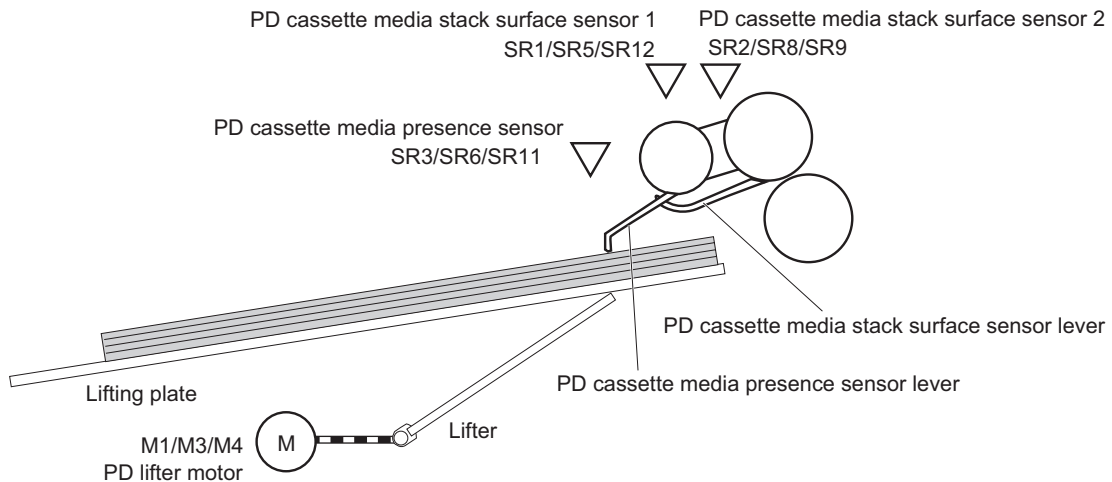
- The product is turned on.
- The cassette is inserted.
- The paper stack surface of the cassette lowers.

The sequence occurs as follows:

1. The PD lifter motor rotates and the lifter moves up.
2. When the tray media-stack-surface sensor detects the stack surface of the paper, the PD lifter motor stops.
3. The PD lifter motor rotates again to lift the lifter when the PD cassette media-stack-surface sensor detects the stack surface, and then lowers during printing.

If a tray media-stack-surface sensor does not detect a stack surface within a specified period after the PD lifter motor starts rotating, the paper feeder driver determines that the PD lifter motor has failed and through the DC controller notifies the formatter.

Figure 1-51 Paper-feeder cassette lift

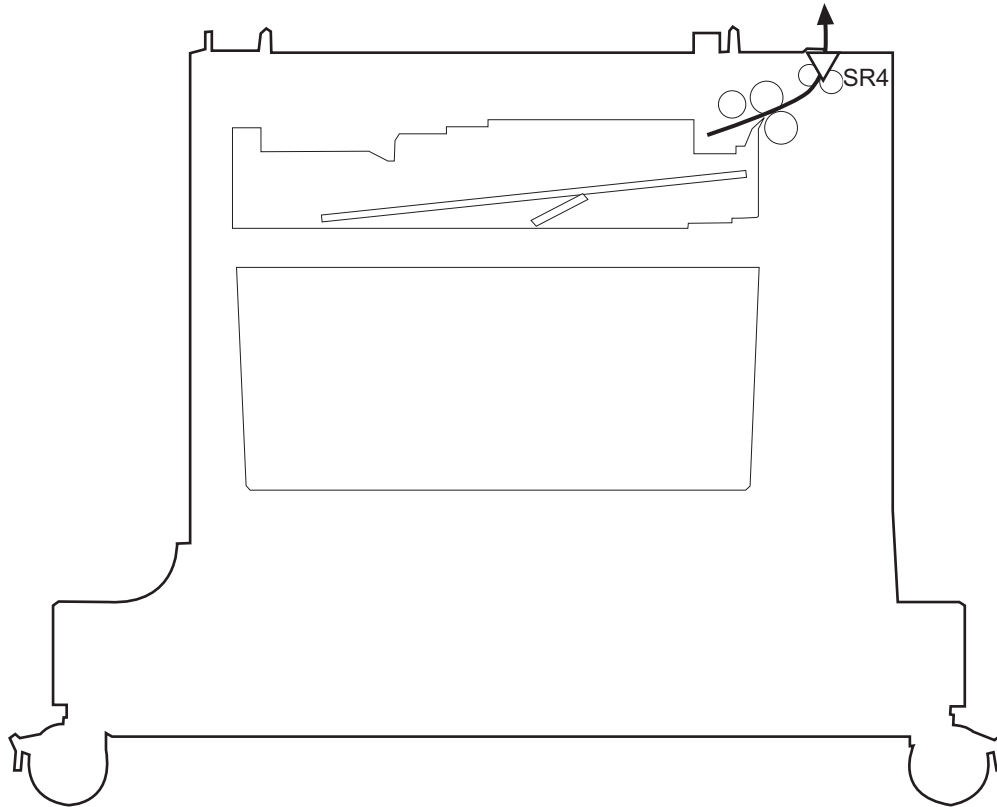


The paper-feeder driver notifies the formatter if either of the paper-feeder media-stack surface sensors fails to detect the stack surface within a specified period from when a lift-up operation starts.

Paper feeder jam detection

The 1 x 500-sheet paper feeder uses the Tray 3 paper presence sensor (SR4) to detect the presence of paper and to check whether paper has jammed.

Figure 1-52 Jam detection (1 x 500-sheet paper feeder)



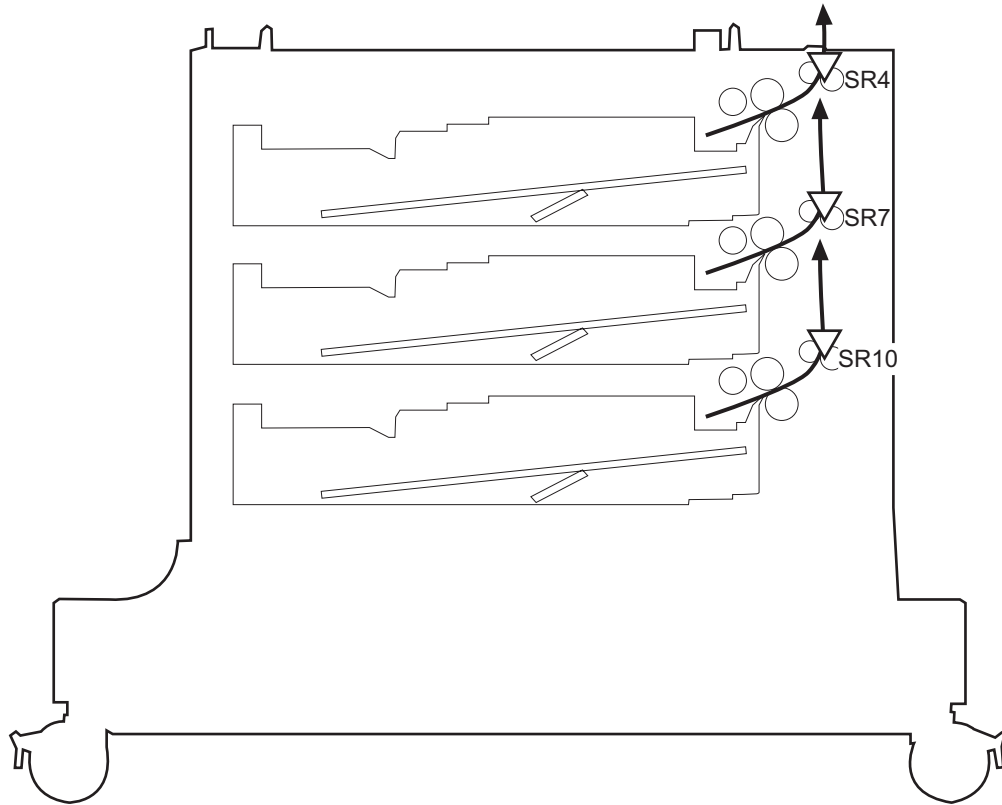
The 1 x 500-sheet paper feeder detects the following jams:

- 1 x 500-sheet PD pickup delay jam: Tray 3 feed sensor does not detect the leading edge of paper within a specified time (including two retries) after the pickup operation starts.
- 1 x 500-sheet PD pickup stationary jam: Tray 3 feed sensor does not detect the trailing edge of paper within a specified time after the sensor detects the leading edge.
- 1 x 500-sheet PD residual paper jam: Tray 3 feed sensor detects the presence of paper for a specified time during an automatic delivery operation.

The 3 x 500-sheet paper feeder uses the following sensors to detect the presence of paper and to check whether paper has jammed.

- Tray 3 paper presence sensor (SR4)
- Tray 4 feed sensor (SR7)
- Tray 5 feed sensor (SR10)

Figure 1-53 Jam detection (3 x 500-sheet paper feeder)



The 3 x 500-sheet paper feeder detects the following jams:

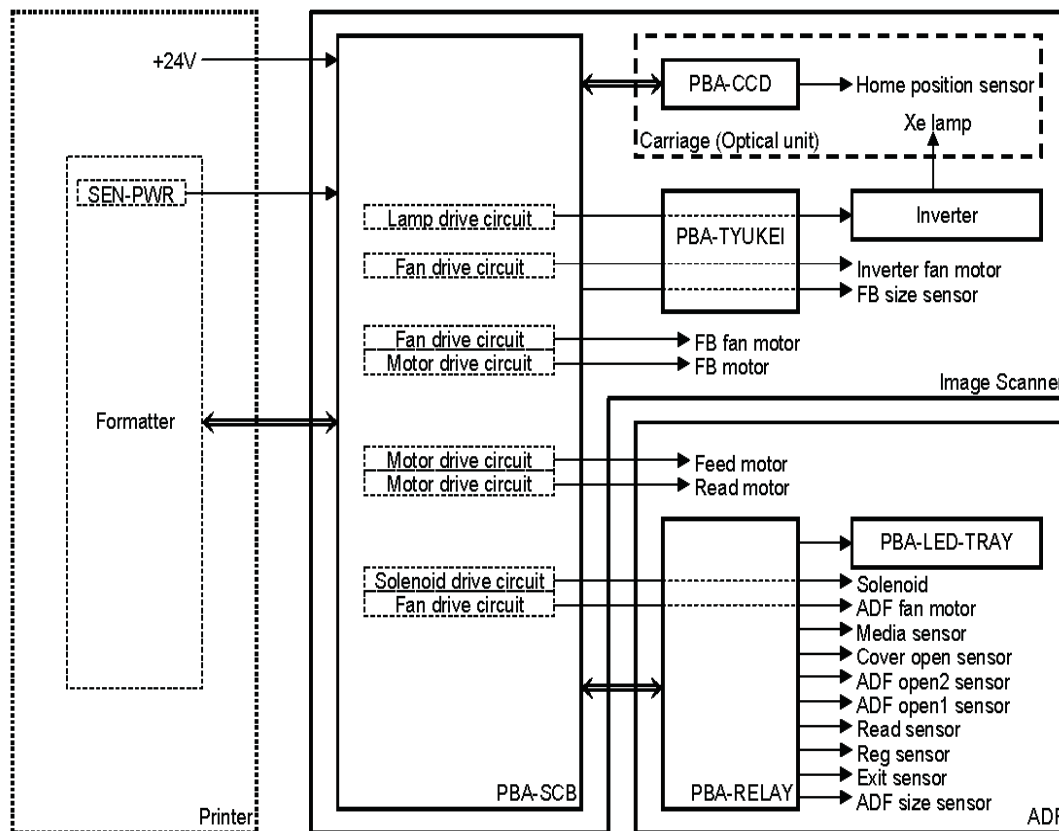
- 3 x 500-sheet PD pickup delay jam: One of the tray feed sensors does not detect the leading edge of paper within a specified time (including two retries) after the pickup operation starts.
- 3 x 500-sheet PD pickup delay jam 2: Tray 3 feed sensor does not detect the leading edge of paper within a specified time (including two retries) after the pickup operation starts.
- 3 x 500-sheet PD pickup stationary jam 1: Tray 4 or 5 feed sensors do not detect the trailing edge of paper within a specified time after the sensor detects the leading edge.
- 3 x 500-sheet PD pickup stationary jam 2: Tray 3 feed sensor does not detect the trailing edge of paper within a specified time after the sensor detects the leading edge.
- 3 x 500-sheet PD residual paper jam: Tray 3, 4, or 5 feed sensors detect the presence of paper for a specified time during an automatic delivery operation.
- 3 x 500-sheet PD door open jam: The door is open during paper feed operation.

Document feeder/scanner assembly

The document feeder/scanner assembly consists of a document feeder and flatbed scanner. The document feeder can feed 50 pages of letter or A4 size paper at speeds up to 57 images per minute in simplex and 24 images per minute in duplex. The document feeder features legal size detection and customer replaceable feed and separation rollers and pads. The flatbed scanner also includes legal detection and does not require a scanner lock for transport. The sensors and motors in both the document feeder and flatbed scanner are controlled and monitored by the SCB that is located on the rear of the flatbed scanner. The copy process board (CPB) is integrated on the formatter. Image data is sent to the formatter through the scanner cable connected to the interconnect board (ICB).

Scanner subsystem

Figure 1-54 Scanner subsystem



The scan control board (SCB), located on the rear of the scanner, provides control of both the scanner and document feeder components. The scanner power supply—located on the rear of the printer above the DCC—provides a +24v current. The formatter supplies a 3.3v current to keep sensors energized while the +24v current is turned off during Sleep. The optical unit contains a Xenon lamp that is driven by a fan-cooled inverter power supply.

The scan control board (SCB), located on the rear of the scanner, provides control of both the scanner and document feeder components. The scanner power supply—located on the rear of the printer above the DCC—provides a +24v current. The formatter supplies a 3.3v current to keep sensors energized while the +24v current is turned off during Sleep. The optical unit contains a Xenon lamp that is driven by a fan-cooled inverter power supply.

The relay PCA in the document feeder provides connections only to the various components such as fans, motors, and sensors. The control and monitoring of these components takes place on the SCB.

Document feeder/scanner motor and fan control

Component	Purpose	Type	Rotation	Timing	Failure detection
Carriage motor	Drives the carriage	Step motor	Clockwise	Initializing	No
			Clockwise	Scanning mono	No
			Clockwise	Scanning color	No
			Counterclockwise	Return	No
Feed motor	Drives the pick, separation, and registration rollers	Step motor	Counterclockwise	Separation	No
			Clockwise	Feeding	No
			Clockwise	Scanning mono (600 x 300)	No
			Clockwise	Scanning mono (600 x 600)	No
			Clockwise	Scanning color (600 x 300)	No
			Clockwise	Scanning color (600 x 600)	No
Read motor	Drives the feed and delivery rollers	Step motor	Counterclockwise	Scanning mono (600 x 300)	No
			Counterclockwise	Scanning mono (600 x 600)	No
			Counterclockwise	Scanning color (600 x 300)	No
			Counterclockwise	Scanning color (600 x 600)	No
			Clockwise	Switch back for duplex scanning	No
Scanner fan	Cools the lamp and CCD	DC motor	Clockwise	Turns on when lamp is on	Yes
Document feeder fan	Cools the motor and solenoid	DC motor	Clockwise	Feeding originals	Yes
Inverter fan	Cools the inverter	DC motor	Clockwise	Turns on when lamp is on	Yes

Legal detection sensor sequence

The legal detection status displays in the following circumstances:

- Document feeder legal detection:
 - When the document feeder legal sensor is turned on.
- Flatbed legal detection:
 - When the flatbed legal sensor is turned on while the flatbed angle sensor is opened.
 - When the flatbed angle sensor is closed but the flatbed legal sensor is turned on.

Fan timing sequence

Fan activated timing

Fans are activated as follows:

- The image scanner fan is activated when the carriage motor or lamp is turned on.
- The document feeder fan is activated when the feed motor or read motor is activated.
- The inverter fan is activated when the carriage motor or lamp is activated.

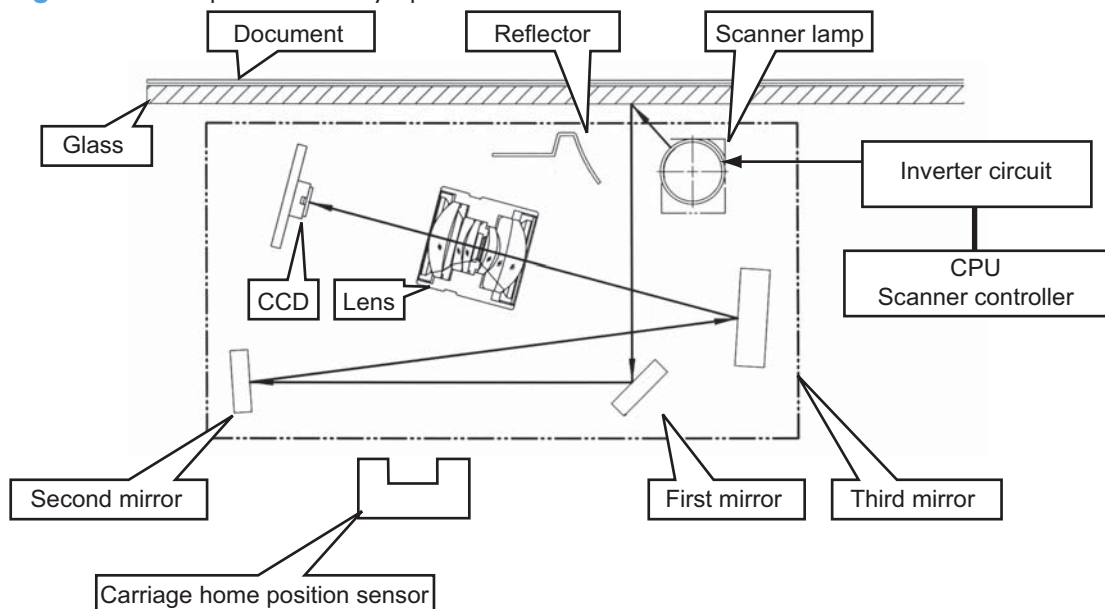
Fan lock failure detection

The scanner, document feeder, and inverter fans have the following failure detection features:

- The fan is turned on. After 5 seconds, the scanner controller begins observing the fan lock signal.
- The fan fails in an error condition. After 5 seconds, the lock condition is detected.
- The scanner completes the job even if the scanner recognizes errors during the job.
- After completing the job, the scanner shifts to the error status and transfers the failure information to the formatter.

Optical assembly operation

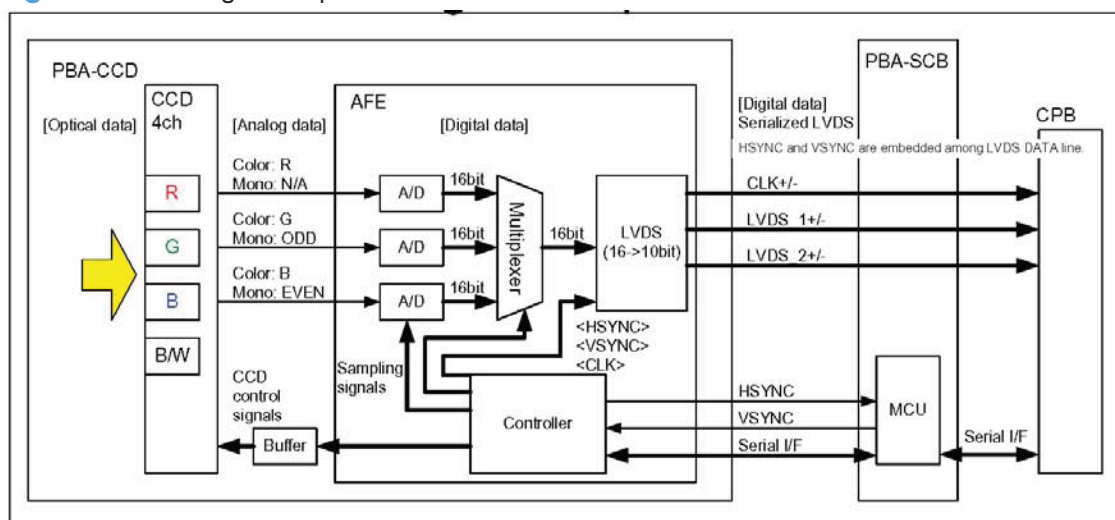
Figure 1-55 Optical assembly operation



The optical assembly contains the lamp, mirrors, lens, and charge-coupled device (CCD). As the optical assembly moves across the original, the lens focuses the reflected image onto the CCD. The optical assembly home position is detected by the carriage home position sensor. During document feeder copying, the optical assembly remains near the home position and the product moves the paper across the document feeder glass strip.

Image data path

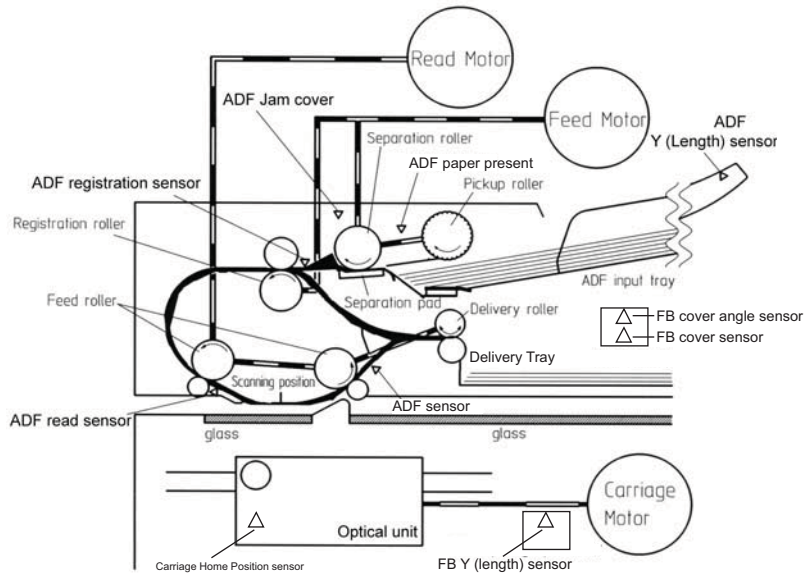
Figure 1-56 Image data path



The product transfers the analog data produced by the CCD/image sensor to the analog front end (AFE), which is a PCA that converts this information to digital form. The digital data exits the scanner assembly and then passes through the scan control board (SCB) to the copy processor board (CPB), which is located on the formatter.

Document feeder/scanner paper path and sensors

Figure 1-57 Document feeder/scanner paper path and sensors



Jam detection sequence

1. A jam error occurs in the document feeder.
2. The feed and read motors stop immediately.
3. The error bit of the scanner status is set. The status information is sent to the CPB.
4. Document feeder operation is terminated.
5. The error bit is held until the jam is cleared.

Clearing a jam

1. Open the jam-access cover and then remove the paper.
2. After the jam-access cover is closed, the error bit is cleared if the sensors detect no media.

Document feeder jam detection

1. After initialization or after the jam-access cover is opened and then closed, the registration sensor, read sensor, or exit sensor are checked for residual paper.
2. The paper did not reach the registration sensor within the standard time. After feeding paper from the input tray, paper is transferred. The motor is stopped if the registration sensor does not detect paper. The motor reverses and attempts to refeed the paper. A pick error occurs if the registration sensor continues to fail to detect paper after the refeed attempt. If there is paper ahead of jammed paper in the paper path, the pick error occurs after the preceding paper is scanned and ejected.
3. Document feeder sensors detect errors in the following situations:

Sensor	Description
Registration sensor	A jam is detected when the registration sensor does not detected the leading edge of paper when turning paper over during the duplexing process.
	A jam is detected when the registration sensor does not detected the trailing edge of paper.
Read sensor	A jam is detected when the read sensor does not detected the leading edge of paper.
	A jam is detected when the read sensor does not detected the trailing edge of paper.
Exit sensor	A jam is detected when the exit sensor does not detected the leading edge of paper.
	A jam is detected when the exit sensor does not detect the trailing edge of paper.

4. Jam-access cover open jam: A jam error occurs if the jam cover is opened while paper is being fed through the document feeder.
5. Document feeder open jam: A jam error occurs if the document feeder is open while a paper is being fed through the document feeder.

Document feeder pick mechanism

1. The pickup-roller picks up a page from the input tray.
2. If multiple pages are picked up, the separation roller and separation pad separates them to prevent feeding of multiple pages.
3. After the page reaches the registration sensor, the pickup and separation rollers stop and registration and read rollers start.

3-bin stapling mailbox

The 3-bin stapling mailbox installs on the delivery assembly and delivers paper to the output bin. The 3-bin stapling mailbox has two modes:

- Stacker mode
- Mailbox/job separator mode

Stapling is available for both modes.

Figure 1-58 3-bin stapling mailbox

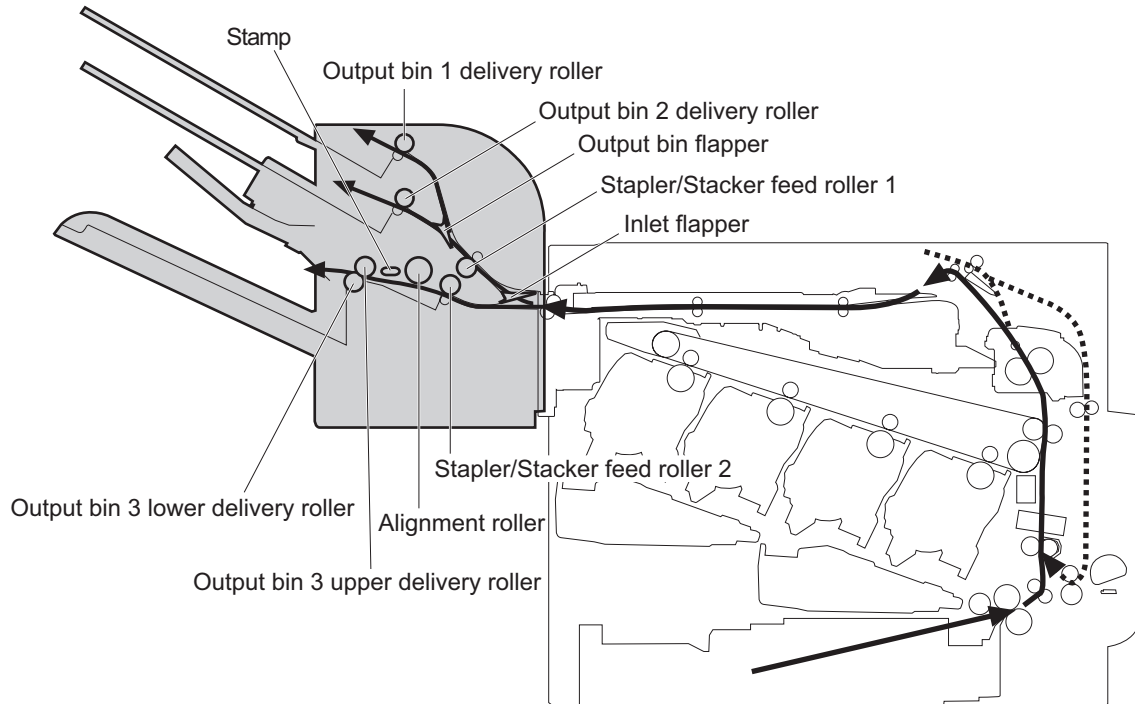
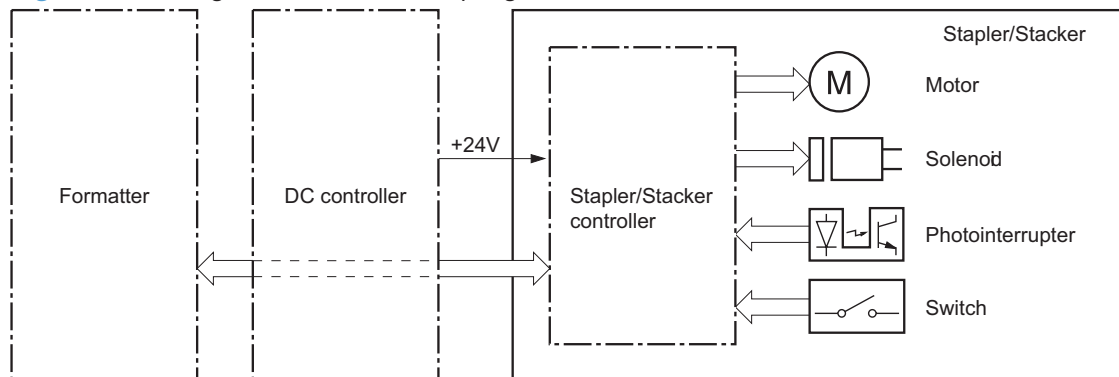


Figure 1-59 Signals for the 3-bin stapling mailbox

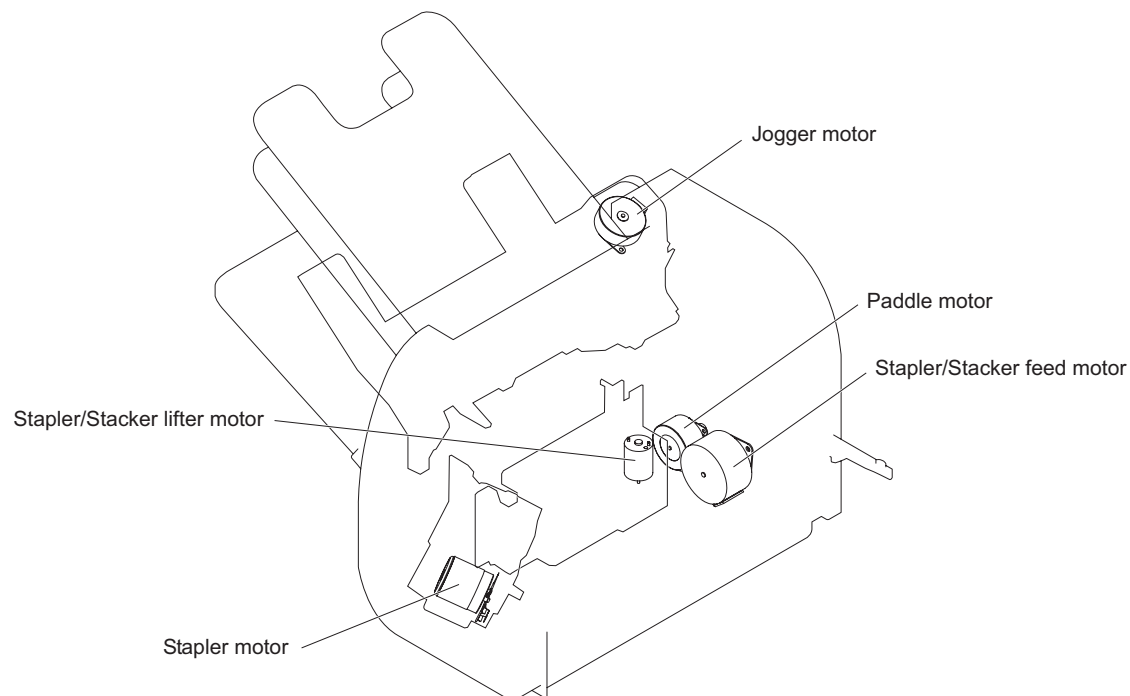


The 3-bin stapling mailbox contains several motors, solenoids, sensors, and switches.

Table 1-17 Electrical components for the 3-bin stapling mailbox

Component type	Abbreviation	Component name
Motors	M1	Stapler motor
	M3	Logger motor
	M4	Paddle motor
	M5	Stapler/Stacker feed motor
	M6	Stapler/Stacker lifter motor
Solenoids	SL1	Stamp solenoid
	SL2	Inlet solenoid
	SL3	Output bin solenoid
Sensors	SR1	Output bin 3 delivery sensor
	SR2	Stapler/Stacker media feed sensor 1
	SR3	Output bin 3 media full sensor
	SR4	Alignment roller sensor
	SR5	Stapler/Stacker media feed sensor 2
	SR6	Logger sensor
	SR7	Output bin 3 upper delivery roller sensor
	PS2501	Output bin 1 media presence sensor
	PS2502	Output bin 2 media full sensor
	PS2503	Output bin 2 media presence sensor
	PS2504	Output bin 1 media full sensor
	PS2601	Output bin 3 higher limit sensor
	PS2602	Output bin 3 lower limit sensor
		Stapler sensor
		Staple presence sensor
		Staple ready sensor
Switches	SW1	Stapler/Stacker door switch

Motor control



The 3-bin stapling mailbox has five motors for paper feed, paper delivery, and staple operation.

Component		Drives		Failure detection
Stapler motor	M1	Stapler		Yes (type 2) ¹
Jogger motor	M3	Jogger guide		Yes (type 2)
Paddle motor	M4	Alignment roller, disengagement of the alignment roller, and disengagement of the output bin 3 lower delivery roller		Yes (type 2)
Stapler/Stacker feed motor	M5	Stapler/Stacker feed roller, Stapler/Stacker delivery roller, output bin 3 upper delivery roller, and the output bin 3 lower delivery roller		No When the motor fails a jam occurs.
Stapler/Stacker lifter motor	M6	Output bin 3		Yes (type 2)

¹ There are two methods for detecting motor failure. Type 1 detects failure by monitoring the motor. Type 2 detects failure by monitoring a related part of the motor.

Failure detection

The controller detects a motor failure by monitoring a part related to the motor. If the controller determines a motor failure or motor-related part failure, it notifies the formatter when it encounters the following conditions:

- Stapler motor: The stapler sensor is not sensed for a specified period of time after the stapler motor starts rotating.
- Jogger motor: The jogger sensor is not sensed for a specified period of time after the jogger motor starts rotating.
- Paddle motor: The output bin 3 upper delivery roller sensor is not sensed for a specified period of time after the paddle motor is rotated. The alignment roller sensor is not sensed for a specified period of time after the paddle motor is reversed.
- Stapler/Stacker lifter motor: The output bin 3 higher limit sensor or output bin 3 media full sensor is not sensed for a specified period of time after the stapler/stacker lifter motor is rotated. The output bin 3 higher limit sensor, output bin 3 lower limit sensor, or output bin 3 media full sensor is not sensed for a specified period from when the stapler/stacker lifter motor is reversed.

Delivery operation

The 3-bin stapling mailbox has two modes.

- Stacker mode: The printed page is delivered to output bin 3 first and then delivered to the subsequent output bins.
- Mailbox/job separator mode: The printed page is delivered to the specified output bin for each print job.

Figure 1-60 3-bin stapling mailbox delivery operation

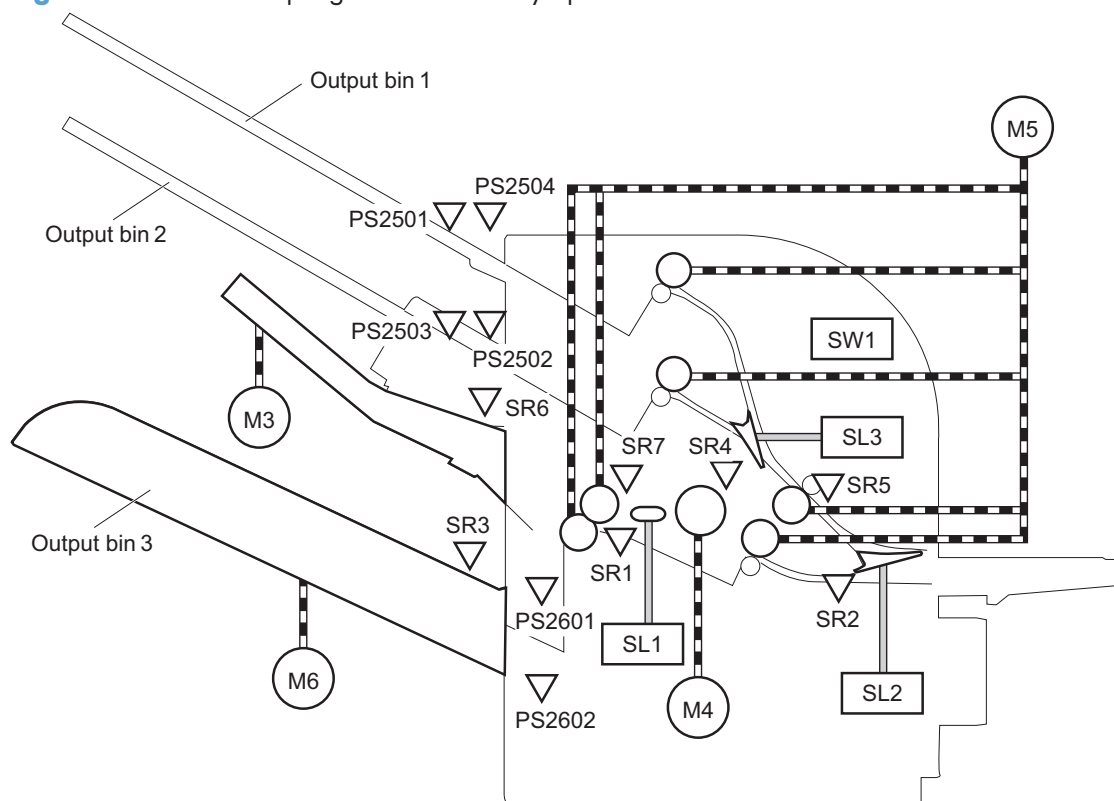


Table 1-18 Delivery components (3-bin stapling mailbox)

Component	
M1	Stapler motor
M3	Jogger motor
M4	Paddle motor
M5	Stapler/Stacker feed motor
M6	Stapler/Stacker lifter motor
SL1	Stamp solenoid
SL2	Inlet solenoid
SL3	Output bin solenoid
SR1	Output bin 3 delivery sensor

Table 1-18 Delivery components (3-bin stapling mailbox) (continued)

Component	
SR2	Stapler/Stacker media feed sensor 1
SR3	Output bin 3 media full sensor
SR4	Alignment roller sensor
SR5	Stapler/Stacker media feed sensor 2
SR6	Logger sensor
SR7	Output bin 3 upper delivery roller sensor
PS2501	Output bin 1 media presence sensor
PS2502	Output bin 2 media full sensor
PS2503	Output bin 2 media presence sensor
PS2504	Output bin 1 media full sensor
PS2601	Output bin 3 higher limit sensor
PS2602	Output bin 3 lower limit sensor
	Stapler sensor
	Staple presence sensor
	Staple ready sensor
SW1	Stapler/Stacker door switch

Staple operation

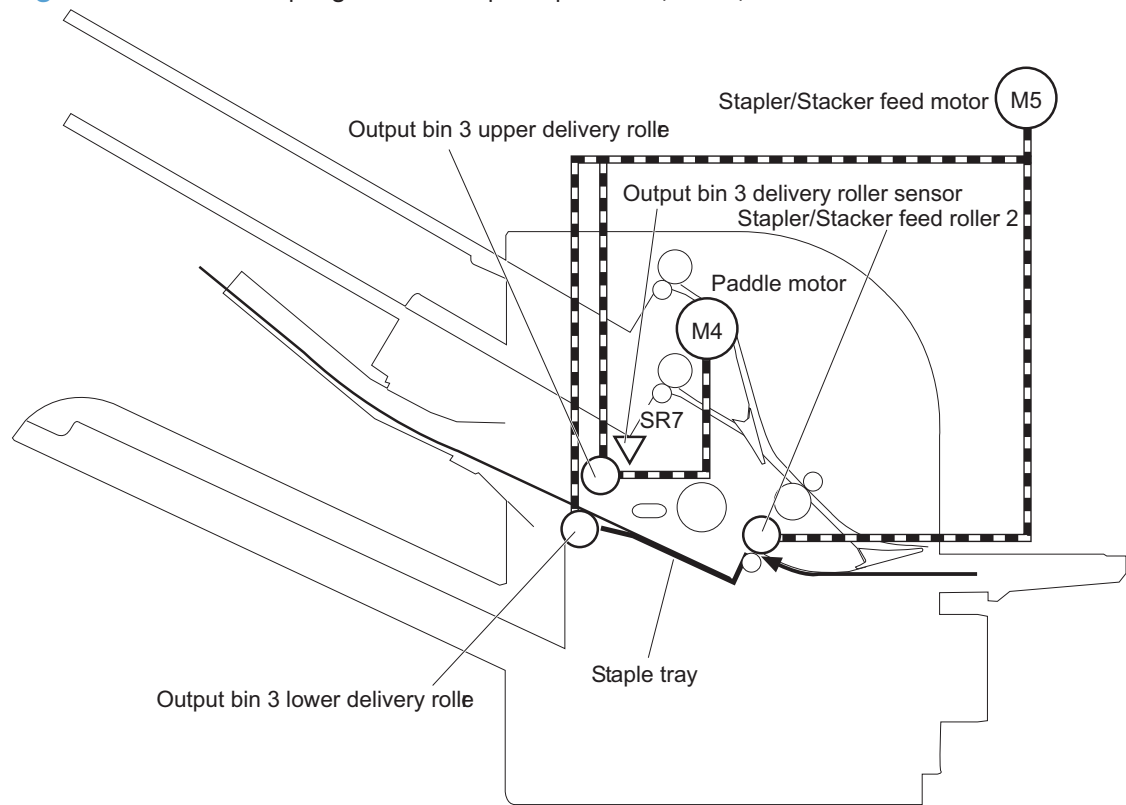
The staple operation staples 2 to 30 sheets of printed pages together into one set and then delivers it to the output bin 3. This staple operation is available for both stacker mode and mailbox/job separator mode.

The staple sequence is as follows:

1. The stapler/stacker controller rotates the paddle motor to disengage the output bin 3 upper delivery roller from the output bin 3 lower delivery roller.

2. The printed page from the product is fed to the staple tray.

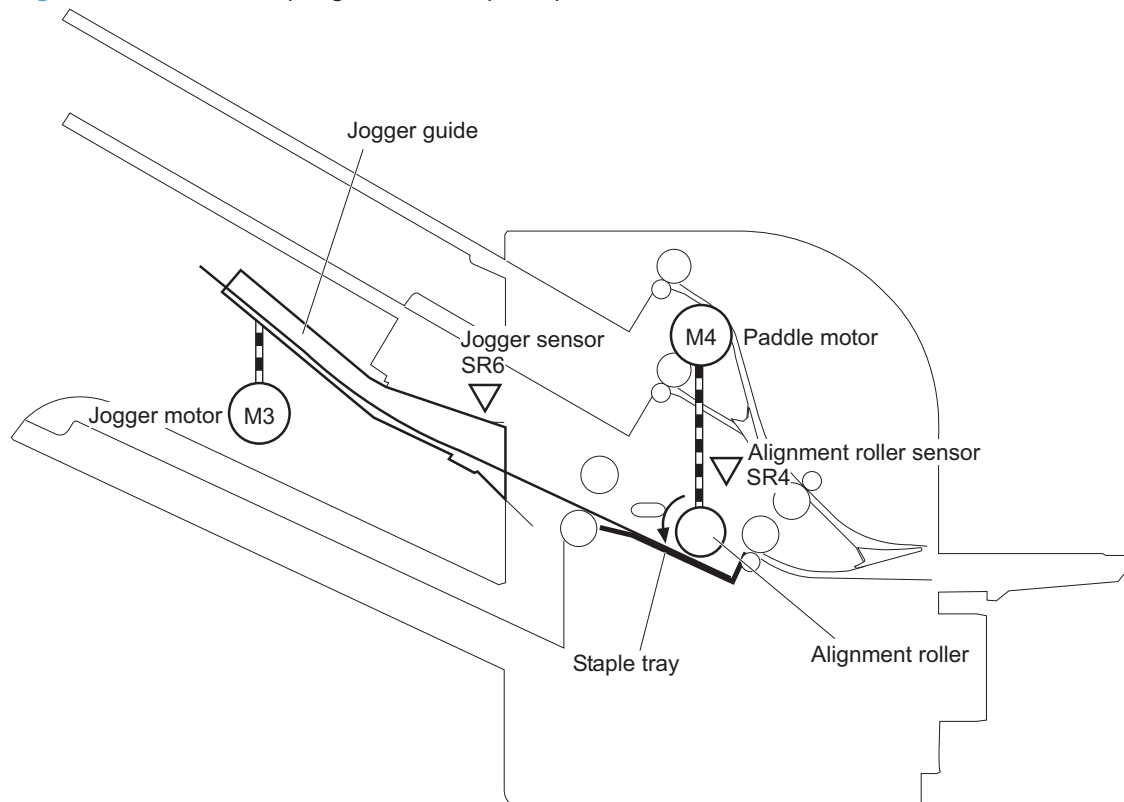
Figure 1-61 3-bin stapling mailbox stapler operation (1 of 4)



The controller determines an output bin 3 upper delivery roller failure and notifies the formatter through the DC controller when it does not detect the output bin 3 upper delivery roller sensor for a specified period after the paddle motor starts rotating.

3. The printed page on the staple tray is aligned. For horizontal alignment, the jogger motor rotates and moves the jogger guide. For vertical alignment, the paddle motor is reversed and the alignment roller pushes the page.

Figure 1-62 3-bin stapling mailbox stapler operation (2 of 4)

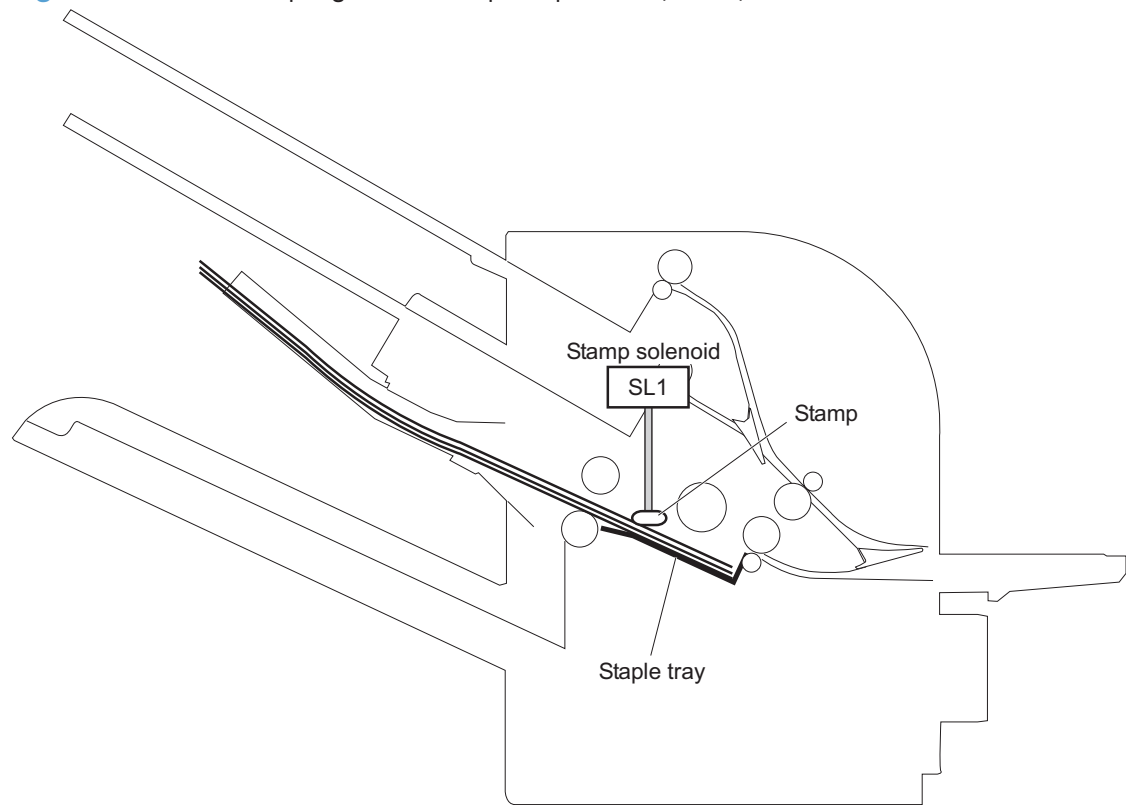


The controller determines a paddle motor failure and notifies the formatter through the DC controller when it does not detect the alignment roller sensor for a specified period after the paddle motor starts rotating.

4. After alignment, the stamp solenoid is driven and the stamp holds the page.
5. Step 1 to 4 repeat for a specified number of pages.

6. After all of the pages are aligned, the pages are stapled together while being held with the stamp.

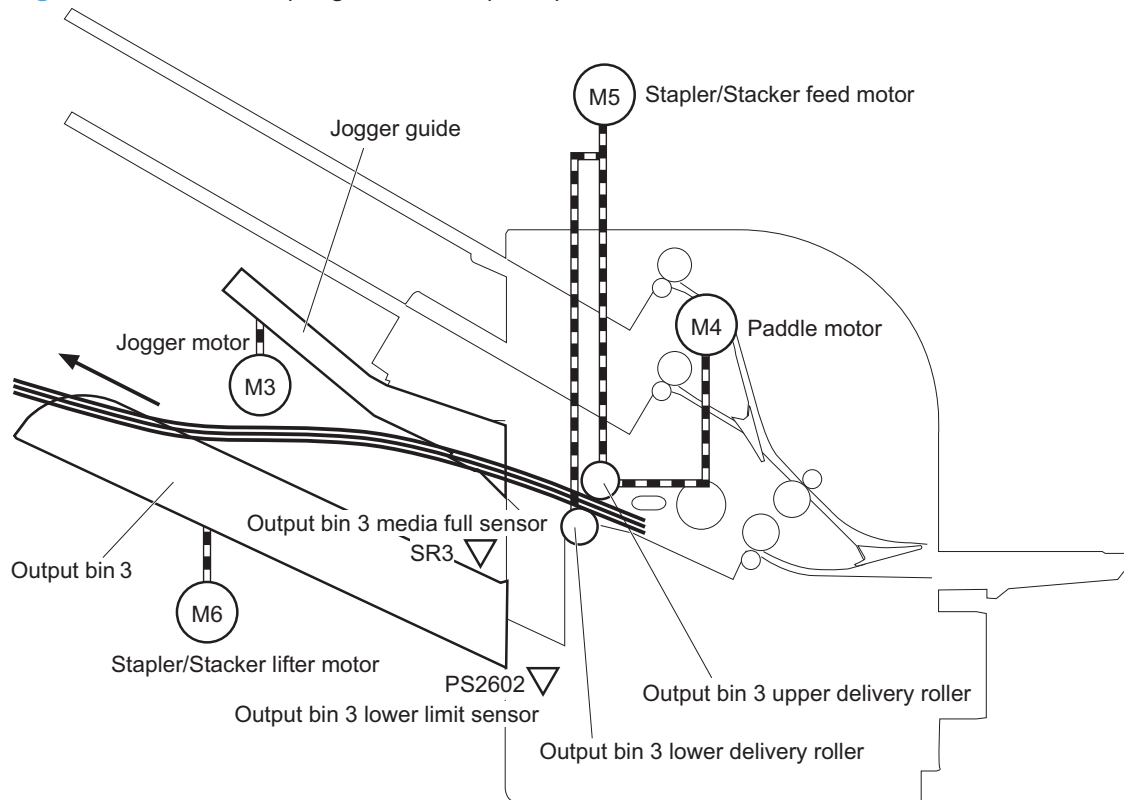
Figure 1-63 3-bin stapling mailbox stapler operation (3 of 4)



7. The paddle motor rotates, and the output bin 3 upper delivery roller touches the stapled pages.
8. The stapler/stacker feed motor rotates to rotate the output bin 3 upper delivery roller and the output bin 3 lower delivery roller. Accordingly, the set of printed-pages is delivered to output bin 3.

9. The stapler/stacker feed motor starts rotating while the jogger motor is reversed and the jogger guide moves to its home position.

Figure 1-64 3-bin stapling mailbox stapler operation (4 of 4)



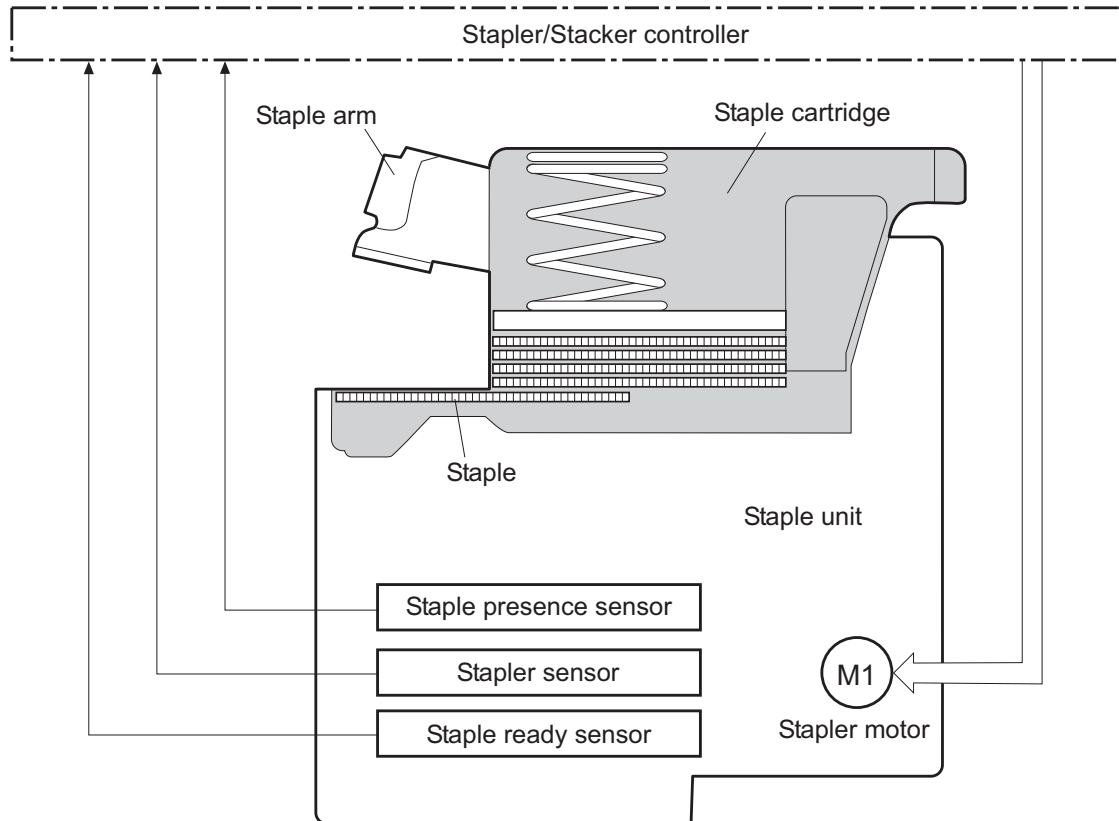
The output bin 3 media full sensor on output bin 3 detects whether the bin is full. The stapler/stacker controller determines that the media stack surface is high and reverses the stapler/stacker lifter motor to lower output bin 3 when the output bin 3 media full sensor is on for a specified period. If the output bin 3 lower limit sensor is turned on at this time, the stapler/stacker controller determines an output bin 3 media full and notifies the formatter through the DC controller.

The stapler/stacker controller determines a jogger motor failure and notifies the formatter through the DC controller when it does not detect the jogger sensor for a specified period after the jogger motor starts rotating.

Stapler

The stapler consists of the staple cartridge and the stapler assembly. The staple cartridge holds up to 5,000 staples. The staple presence sensor detects the presence of staple. The staple ready sensor detects whether the stapler is in the correct position to staple. The stapler assembly is equipped with the stapler motor. When the stapler/stacker controller rotates the stapler motor, the staple arm lowers and staple operation begins. The stapler sensor detects the position of the staple arm.

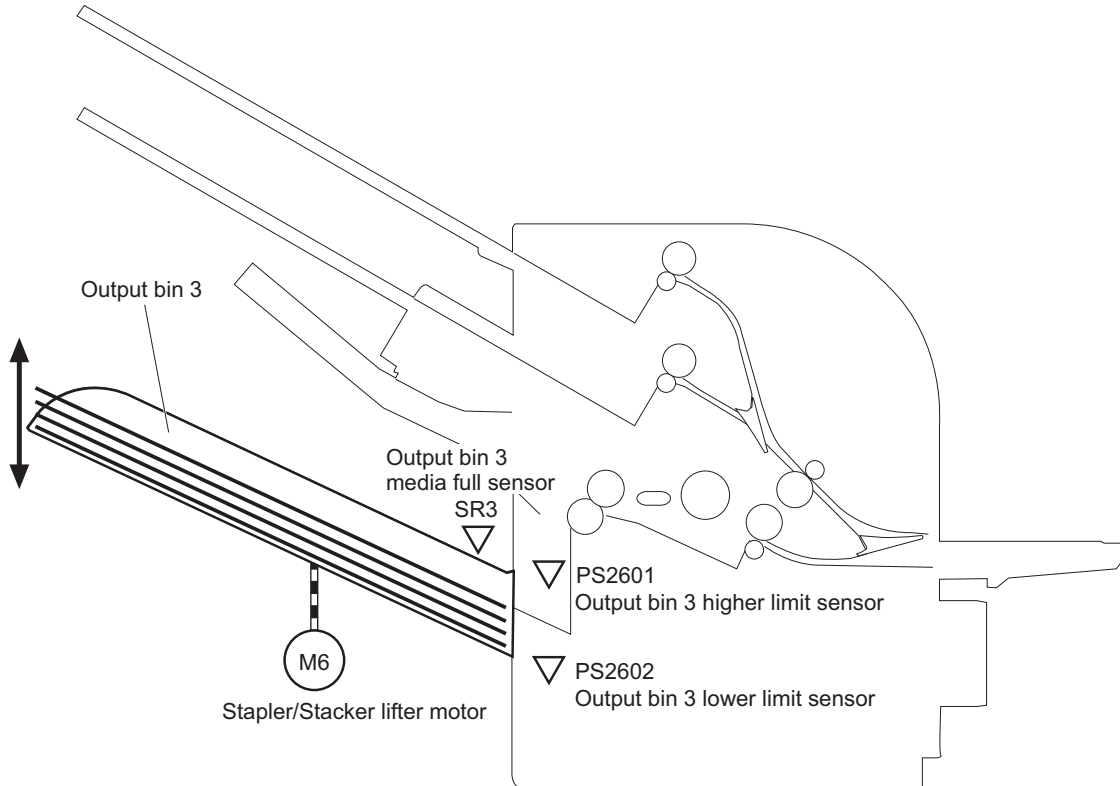
Figure 1-65 3-bin stapling mailbox sensors for the stapler



The stapler/stacker controller determines a stapler motor failure and notifies the formatter through the DC controller when it does not detect the stapler sensor for a specified period after the stapler motor starts rotating. The stapler/stacker controller determines a stapler jam and notifies the formatter through the DC controller if it senses the stapler sensor after a specified period of time from when the stapler motor starts rotating and then if the stapler sensor recovers within a specified period of time from when the stapler motor is reversed.

Output bin 3 lift operation

Figure 1-66 3-bin stapling mailbox sensors for output bin 3 lift operation



The operational sequence of the output bin 3 lift operation is as follows:

1. The stapler/stacker lifter motor rotates if both the output bin 3 higher limit sensor and the output bin 3 media full sensor are off when the product is turned on until following conditions occur:
 - The output bin 3 higher limit sensor detects the output bin 3.
 - The output bin 3 media full sensor detects paper.

The stapler/stacker lifter motor is reversed if either the output bin 3 higher limit sensor or the output bin 3 media full sensor is on, or if both sensors are on when the product is turned on to lower the output bin 3 to a specified level.

2. When the printed pages are stacked on the output bin 3, and the output bin 3 media full sensor detects the paper, the stapler/stacker lifter motor is reversed to lower the output bin 3 to a specified level.
3. The stapler/stacker controller notifies the formatter through the DC controller when the output bin 3 media full sensor detects paper. The output bin 3 lowers to the position of the output bin 3 lower limit sensor.

The stapler/stacker controller determines a stapler/stacker lifter motor failure. The controller notifies the formatter through the DC controller when it encounters the following conditions after the stapler/stacker lifter motor starts rotating:

- Output bin 3 does not reach the output bin 3 higher limit sensor within a specified period of time.
- The output bin 3 media full sensor does not detect paper

The stapler/stacker controller determines a stapler/stacker lifter motor failure. The controller notifies the formatter through the DC controller when the following sensor is not sensed after the stapler/stacker lifter motor is reversed:

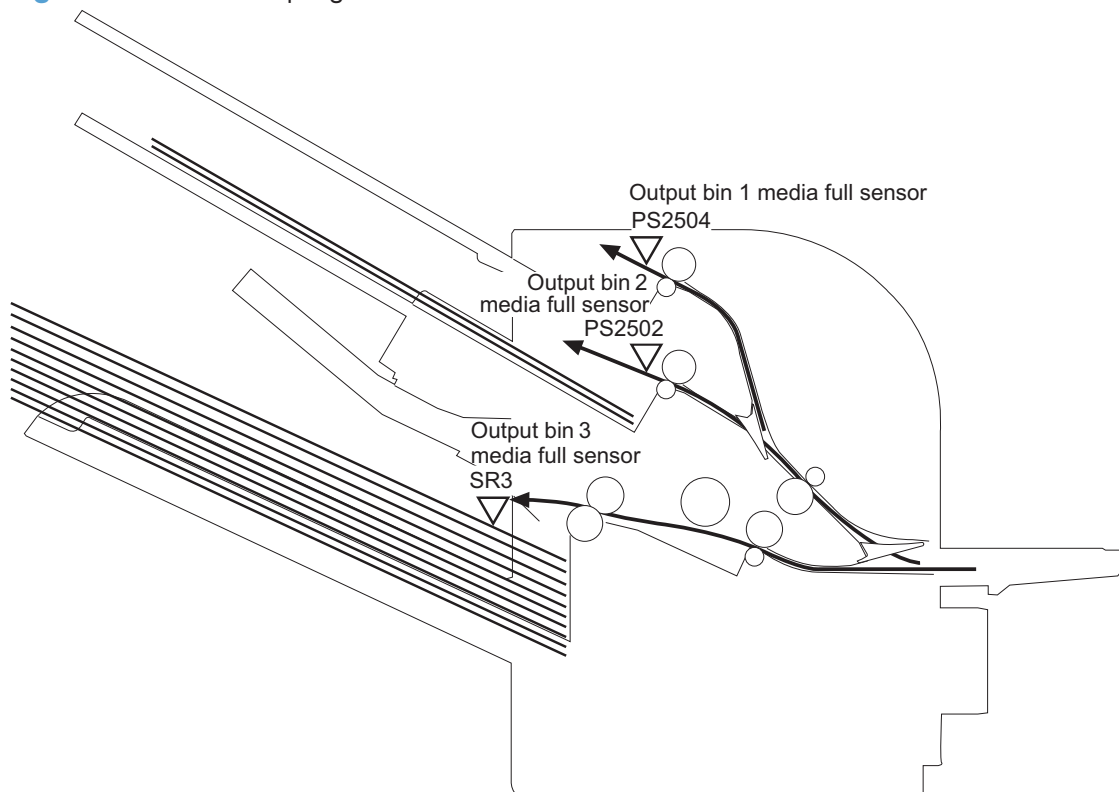
- Output bin 3 higher limit sensor
- Output bin 3 lower limit sensor
- Output bin 3 media full sensor

Stacker mode

Stacker mode does not designate an output bin. It delivers the printed page to the output bin 3 first and then to the next bin up.

When the output bin 3 media full sensor detects that output bin 3 is full, the 3-bin stapling mailbox delivers to output bin 2. When the output bin 2 media full sensor detects that the output bin 2 is full, the 3-bin stapling mailbox delivers to output bin 1.

Figure 1-67 3-bin stapling mailbox sensors for stacker mode



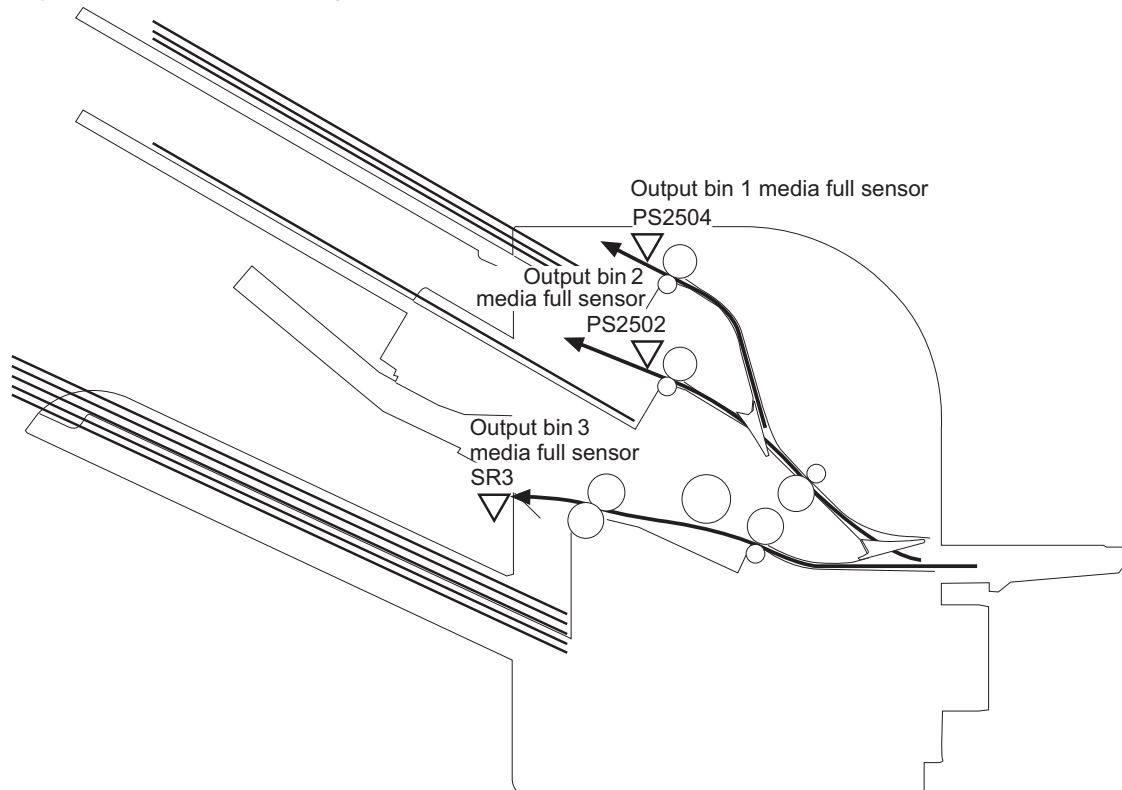
The stapler/stacker controller determines if the 3-bin stapling mailbox is full and notifies the formatter through the DC controller when it encounters the following condition:

- The output bin 1 media full is detected.
- The staple operation is designated when the output bin 3 is full of paper.

Mailbox/job separator mode

The mailbox/job separator mode delivers the printed page to the designated bin for each print job.

Figure 1-68 3-bin stapling mailbox sensors for mailbox/job separation



The stapler/stacker controller determines if the 3-bin stapling mailbox is full and notifies the formatter through the DC controller when it encounters the following condition:

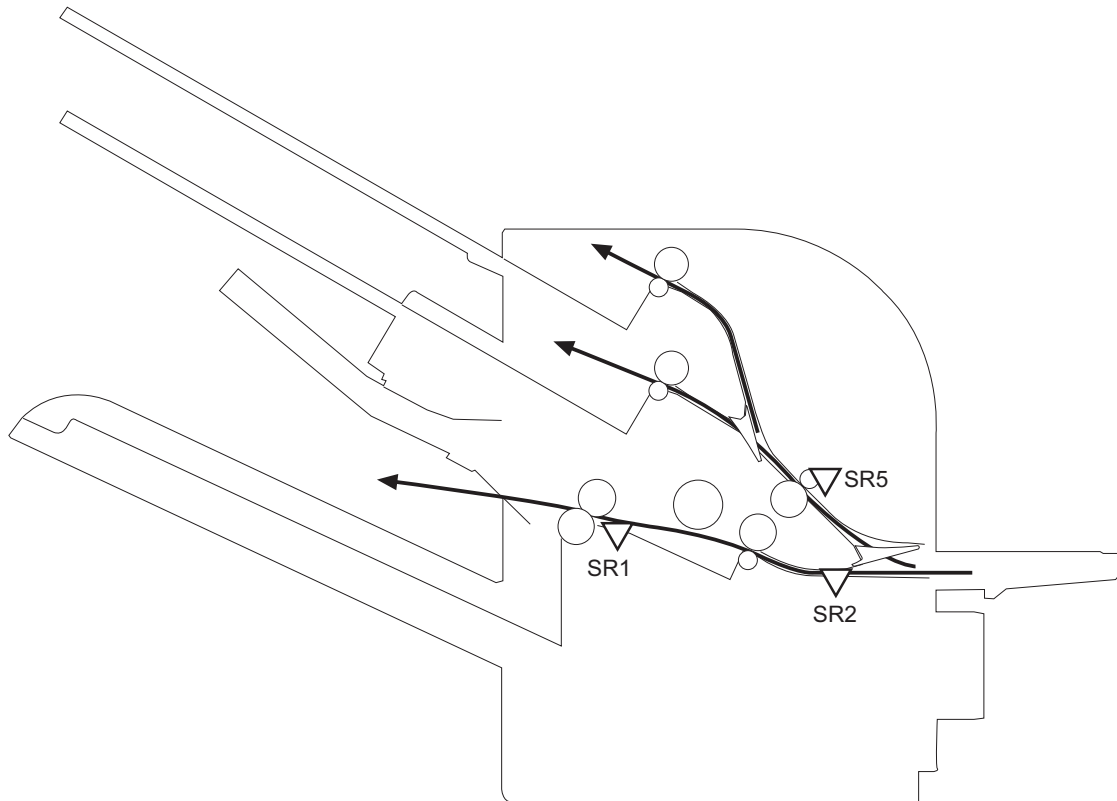
- The designated output bin media full is detected.
- The staple operation is designated when output bin 3 is full of paper.

Jam Detection

The 3-bin stapling mailbox uses the following sensors to detect the presence of paper and to check whether paper is being fed correctly or has jammed:

- Output bin 3 delivery sensor (SR1)
- Stapler/stacker media feed sensor 1 (SR2)
- Stapler/stacker media feed sensor 2 (SR5)

Figure 1-69 3-bin stapling mailbox sensors for jam detection



The stapler/stacker detects the following jams:

- Stapler/Stacker feed delay jam 1: The stapler/stacker media feed sensor 1 does not detect the leading edge of paper within a specified period of time after the fixing delivery sensor in the product detects the leading edge.
- Stapler/Stacker feed delay jam 2: The stapler/stacker media feed sensor 2 does not detect the leading edge of paper within a specified period of time after the fixing delivery sensor in the product detects the leading edge.
- Stapler/Stacker feed stationary jam 1: The stapler/stacker media feed sensor 1 does not detect the trailing edge of paper within a specified period of time after it detects the leading edge.
- Stapler/Stacker feed stationary jam 2: The stapler/stacker media feed sensor 2 does not detect the trailing edge of paper within a specified period of time after it detects the leading edge.

- Stapler/Stacker feed stationary jam 3: The output bin 3 delivery sensor does not detect the trailing edge of paper within a specified period of time from when the stapler/stacker feed motor starts rotating after a staple operation.
- Stapler/Stacker residual paper jam: Any one of the following sensors detects a presence of paper for a specified period of time during an automatic delivery operation:
 - Output bin 3 delivery sensor
 - Stapler/Stacker media feed sensor 1
 - Stapler/Stacker media feed sensor 2

Automatic Delivery

The stapler/stacker automatically clears the paper if any one of the following sensors detects the residual paper during the initial sequence after the stapler/stacker is turned on or after the door is closed.

- Output bin 3 delivery sensor
- Stapler/Stacker media feed sensor 1
- Stapler/Stacker media feed sensor 2

2 Removal and replacement

- [Introduction](#)
- [Removal and replacement strategy](#)
- [Electrostatic discharge](#)
- [Required tools](#)
- [Before performing service](#)
- [After performing service](#)
- [Post-service test](#)
- [Parts removal order](#)
- [Customer self repair \(CSR\) components](#)
- [External panels, covers, and doors](#)
- [Document feeder](#)
- [Scanner](#)
- [Internal assemblies](#)
- [Optional paper feeder assemblies \(1 x 500-sheet and 3 x 500-sheet\)](#)
- [Optional 500-sheet paper feeder assembly](#)
- [Stapling mailbox](#)

Introduction

This chapter describes the removal and replacement of field-replaceable units (FRUs) only.


Replacing FRUs is generally the reverse of removal. Occasionally, notes and tips are included to provide directions for difficult or critical replacement procedures.

HP does *not* support repairing individual subassemblies or troubleshooting to the component level.

Note the length, diameter, color, type, and location of each screw. Be sure to return each screw to its original location during reassembly.


Incorrectly routed or loose wire harnesses can interfere with other internal components and can become damaged or broken. Frayed or pinched harness wires can be difficult to find. When replacing wire harnesses, always use the provided wire loops, lance points, or wire-harness guides and retainers.


Removal and replacement strategy


 **WARNING!** Turn the product off, wait 5 seconds, and then remove the power cord before attempting to service the product. If this warning is not followed, severe injury can result, in addition to damage to the product. The power must be on for certain functional checks during troubleshooting. However, disconnect the power supply during parts removal.

Never operate or service the product with the protective cover removed from the laser/scanner assembly. The reflected beam, although invisible, can damage your eyes.


The sheet-metal parts can have sharp edges. Be careful when handling sheet-metal parts.

 **CAUTION:** Do not bend or fold the flat flexible cables (FFCs) during removal or installation. Also, do not straighten pre-folds in the FFCs. You *must* fully seat all FFCs in their connectors. Failure to fully seat an FFC into a connector can cause a short circuit in a PCA.

 **NOTE:** To install a self-tapping screw, first turn it counterclockwise to align it with the existing thread pattern, and then carefully turn it clockwise to tighten. Do not overtighten. If a self-tapping screw-hole becomes stripped, repair the screw-hole or replace the affected assembly.

 **TIP:** For clarity, some photos in this chapter show components removed that would not be removed to service the product. If necessary, remove the components listed at the beginning of a procedure before proceeding to service the product.

Electrostatic discharge

⚠ CAUTION:  Some parts are sensitive to electrostatic discharge (ESD). Look for the ESD reminder when removing product parts. Always perform service work at an ESD-protected workstation or mat, or use an ESD strap. If an ESD workstation, mat, or strap is not available, ground yourself by touching the sheet-metal chassis *before* touching an ESD-sensitive part.

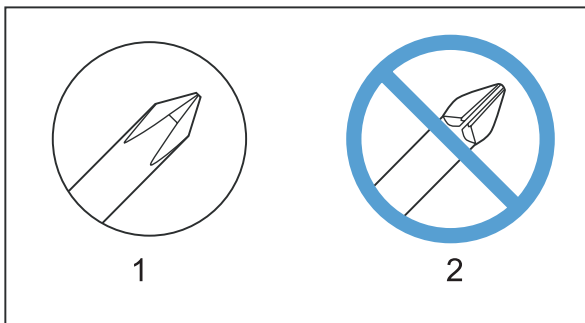
Protect the ESD-sensitive parts by placing them in ESD pouches when they are out of the product.

Required tools

- #2 Phillips screwdriver with a magnetic tip and a 152-mm (6-inch) shaft length
- Small flat blade screwdriver
- Needle-nose pliers
- ESD mat or ESD strap (if one is available)
- Penlight (optional)
- USB thumbdrive

⚠ CAUTION: Always use a Phillips screwdriver (callout 1). Do not use a pozidrive screwdriver (callout 2) or any motorized screwdriver. These can damage screws or screw threads.

Figure 2-1 Phillips and pozidrive screwdriver comparison




Before performing service

- Remove all media from the product.
- Turn off the power using the power switch.
- Unplug the power cable and interface cable or cables.
- Place the product on an ESD workstation or mat, or use an ESD strap (if one is available). If an ESD workstation, mat, or strap is not available, ground yourself by touching the sheet-metal chassis *before* touching an ESD-sensitive part.
- Remove the print cartridges. See [Print cartridges on page 103](#).
- Remove the tray cassette or cassettes. See [Tray on page 111](#).

After performing service

- Plug in the power cable.
- Reinstall the print cartridges.
- Reinstall the tray cassette or cassettes.
- If the optional paper feeder was installed, place the product on the feeder.

 **WARNING!** The product is heavy. Do not try to separate the product from the optional paper feeder by yourself. Three people are required to lift the product off of the feeder.

Post-service test

Perform the following test to verify that the repair or replacement was successful.

Print-quality test

1. Verify that you have completed the necessary reassembly steps.
2. Make sure that the tray contains clean, unmarked paper.
3. Attach the power cord and interface cable or interface cables, and then turn on the product.
4. Verify that the expected startup sounds occur.
5. Print a configuration page, and then verify that the expected printing sounds occur.
6. Print a demo page, and then verify that the print quality is as expected.
7. Send a print job from the host computer, and then verify that the output meets expectations.
8. If necessary, restore any customer-specified settings.
9. Clean the outside of the product with a damp cloth.

Parts removal order

Figure 2-2 Parts removal order (1 of 2)

Component	Remove	Remove	Remove	Remove	Remove	Remove
Print cartridges						
Toner collection unit (TCU)						
Formatter						
Memory DIMMS						
Fuser						
Tray 1 pickup roller	Roller cover					
Tray 2-5 feed and separation rollers						
Control panel						
Standard output bin						
Output bin bezel						
S-CVR-REAR (scanner rear cover)						
ASY-CBR-F-SP (ADF front cover)						
ASY-CBR-F-R-SP (ADF rear cover)						
S-CVR-LEFT (scanner left cover)						
ADF						
Scanner	Control panel	S-CVR-REAR	ADF			
Fan cover	Standard output bin	Output bin bezel				
Right-front cover						
Front-door assy	Right-front cover					
Right-door assy						
Right-rear cover	ADF	Standard output bin	Scanner assembly			
Lower left cover						
Left cover	Standard output bin	Output bin bezel	Fan cover			
Rear cover	Fan cover	Lower-left cover				
Secondary transfer assy (T2)						
Intermediate transfer belt (ITB)						
Cassette feed guide						
IPTU	Standard output bin	Output bin bezel	S-CVR-REAR	ADF	Scanner assembly	
Separation pad (Tray 1)	Pickup roller	Right door assembly				
Registration density (RD) sensor	ITB	Secondary transfer assembly				
Registration assembly	ITB	Secondary transfer assembly				
Residual-toner duct and feed assembly	Toner-collection unit	ITB	Standard output bin	Output bin bezel	S-CVR-REAR	Fan cover
Residual-toner-feed motor	ITB	Standard output bin	Output bin bezel	S-CVR-REAR	Left cover	
Cartridge fan	Standard output bin	Output bin bezel	Fan cover	Lower-left cover		
Toner-collection sensor	Toner-collection unit	Standard output bin	Output bin bezel	Lower-left cover	Fan cover	Left cover
Delivery fan	Standard output bin	Output bin bezel	S-CVR-REAR	Fan cover	ADF	Scanner assembly
Delivery assy	Fuser	ITB	Standard output bin	Output bin bezel	S-CVR-REAR	Fan cover
Duplex-drive assy	Fuser	ITB	Standard output bin	Output bin bezel	S-CVR-REAR	Fan cover
Power-supply (PS) fan	Standard output bin	Output bin bezel	S-CVR-REAR	Lower-left cover	Left cover	ADF
Image scanner power supply unit (PSU)	S-CVR-REAR	Lower-left cover	Fan cover	Rear cover	ADF	Scanner assembly
Interconnect board (ICB)	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Rear cover	ADF
DC controller (DCC)	Standard output bin	Output bin bezel	S-CVR-REAR	Lower-left cover	Fan cover	Rear cover
Low-voltage power supply (LVPS)	Formatter	S-CVR-REAR	Lower-left cover	Fan cover	Rear cover	ADF
High-voltage power supply (HVPS)-lower	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover
High-voltage power supply (HVPS)-upper	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover
Developing-disengagement motor	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover
Exhaust fan and fan duct	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover
Pickup motor	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover
Lifter-drive assembly	Formatter	ITB	S-CVR-REAR	Fan cover	Lower-left cover	Left cover
Lifter base assembly	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover
Tray-pickup drive assembly	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover
Tray-pickup assy	Formatter	ITB	S-CVR-REAR	Lower-left cover	Left cover	Rear cover
Laser Scanner (Y/M)	TCU	ITB	S-CVR-REAR	Fan cover	Lower-left cover	Left cover
Laser scanner (C/Bk)	TCU	ITB	S-CVR-REAR	Fan cover	Lower-left cover	Left cover
Drum motors	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover
Fuser motor	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover
ITB motor	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover
Main drive	Formatter	S-CVR-REAR	Fan cover	Lower-left cover	Left cover	Rear cover

Figure 2-3 Parts removal order (2 of 2)

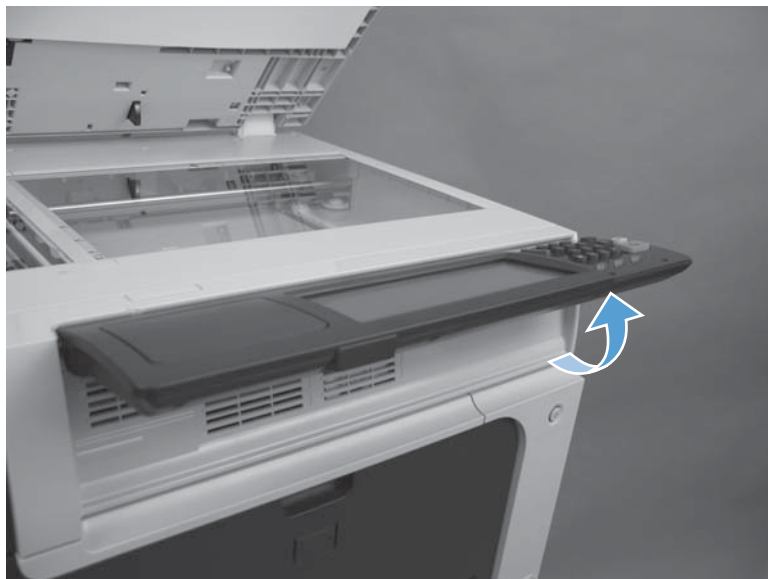
Remove	Remove	Remove	Remove	Remove	Remove	Remove	Remove	Remove	Remove

Customer self repair (CSR) components

Control panel

1. Lift the control panel.

Figure 2-4 Remove the control panel (1 of 3)



2. Remove one screw.

Figure 2-5 Remove the control panel (2 of 3)



3. Disconnect one connector, and then move the control panel to the right to remove.

Figure 2-6 Remove the control panel (3 of 3)



4. When reinstalling the control panel, make sure the bracket fits correctly on the product.

Figure 2-7 Incorrect installation of the control panel

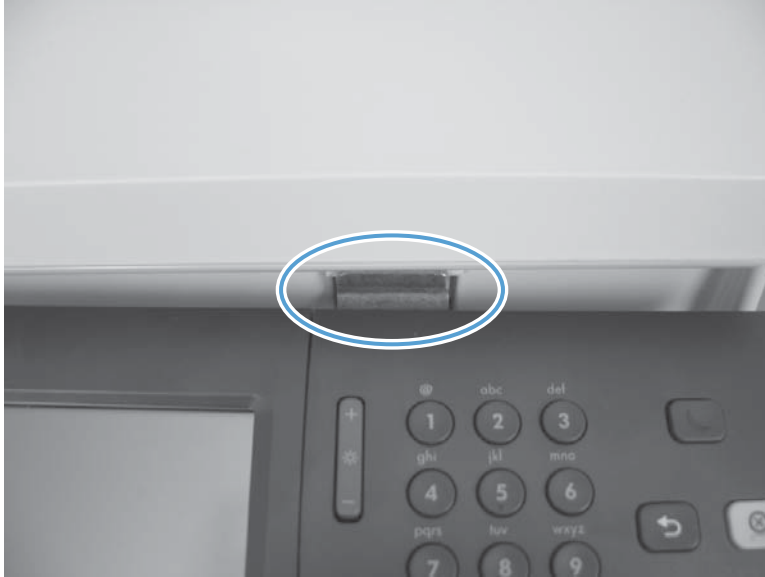


Figure 2-8 Correct installation of the control panel



Print cartridges

CAUTION: If toner gets on your clothing, wipe it off with a dry cloth and wash clothing in cold water. *Hot water sets toner into fabric.*

1. Open the front door. Make sure that the door is completely open.

Figure 2-9 Remove the print cartridge (1 of 2)



2. Grasp the print-cartridge handle and pull out to remove.


CAUTION: Do not touch the green roller. Doing so can damage the cartridge. Do not expose the cartridge to strong light. Cover the cartridge with a sheet of paper to protect it from light.

Reinstallation tip Align the print cartridge with its slot and insert the print cartridge until it clicks into place.

Figure 2-10 Remove the print cartridge (2 of 2)



Toner-collection unit

 **NOTE:** The toner-collection unit is designed for a single use. Do not try to empty the toner-collection unit and reuse it. Doing so could cause toner to spill inside the product and result in reduced print quality. For recycling information, see the product user guide.

1. Open the front door. Make sure that the door is completely open.

Figure 2-11 Remove the toner-collection unit (1 of 4)



2. Grasp the top of the toner-collection unit and remove it from the product.


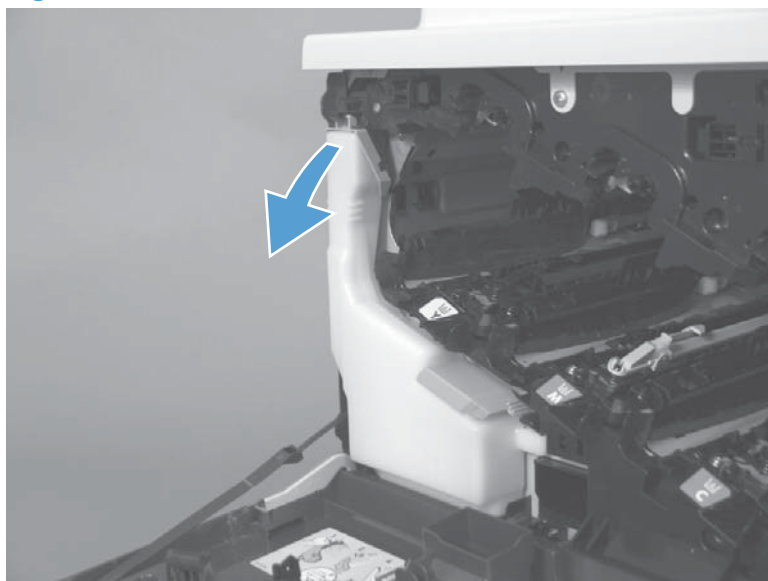
 **Reinstallation tip** Insert the bottom of the replacement unit into the product first and then push the top of the unit until it clicks into place. If the toner-collection unit is installed incorrectly, the front door will not close completely.

Figure 2-12 Remove the toner-collection unit (2 of 4)



3. To prevent toner spills, place the blue cap (callout 1) over the blue opening at the top of the unit (callout 2).

Figure 2-13 Remove the toner-collection unit (3 of 4)

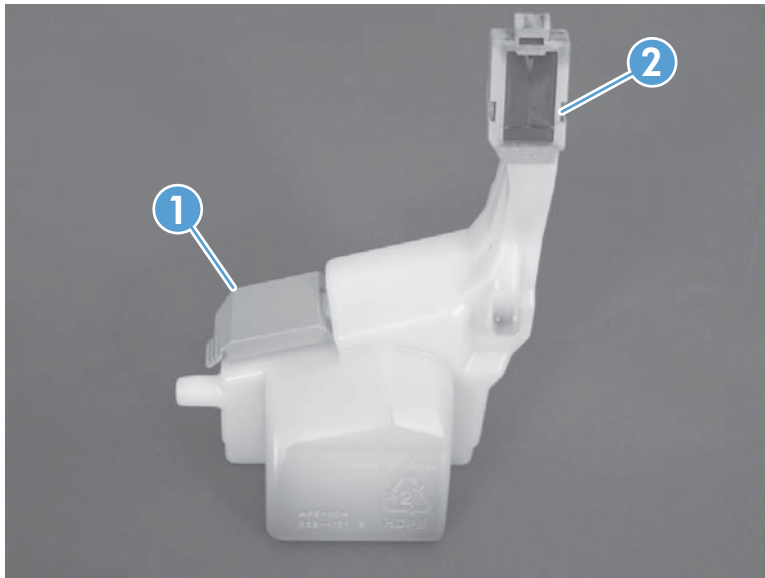
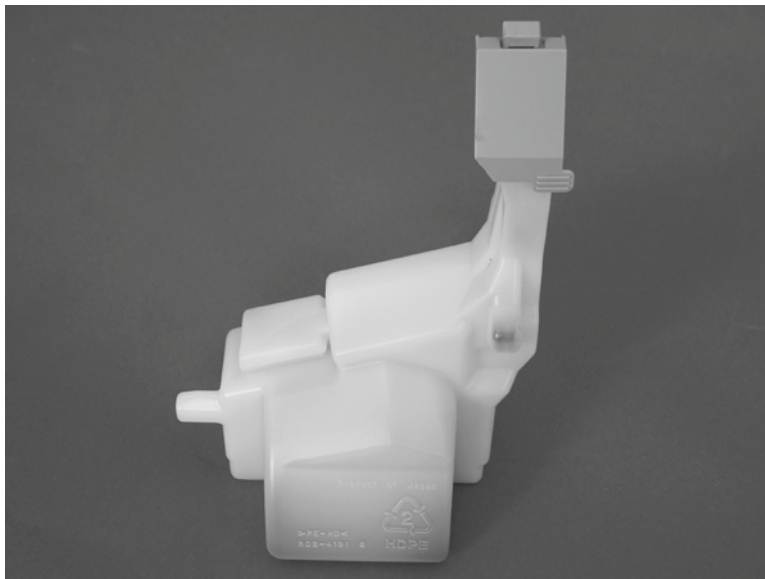


Figure 2-14 Remove the toner-collection unit (4 of 4)



Formatter PCA

 **CAUTION:**  ESD sensitive component.

1. Turn the product off and disconnect the power and interface cable or interface cables.
2. Unscrew the formatter thumb screws, and then firmly pull the formatter from the product. Place the formatter on a clean, flat, grounded surface.

Figure 2-15 Remove the formatter



3. Remove the hard drive and fax card from the existing formatter and reinstall on the new formatter. See [Fax card on page 107](#) and [Hard drive on page 108](#).

 **NOTE:** When reinstalling the formatter, push firmly on the right side to make sure the formatter is seated.

Fax card

Before proceeding, remove the following components:

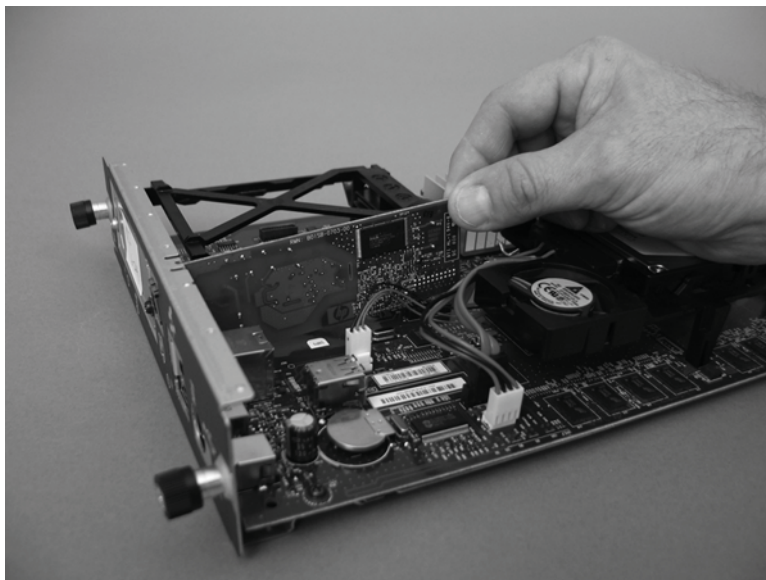
- Formatter PCA. See [Formatter PCA on page 106](#).


Remove the fax card

 **CAUTION:**  ESD sensitive component.

- ▲ Lift the inside edge of the fax card and then remove.

Figure 2-16 Remove the fax card



 **Reinstallation tip** Make sure that the fax card is installed correctly. If it is installed incorrectly, it can cause the formatter PCA to not connect properly when it is reinstalled. If this occurs, the product displays a **30.01.YY Scanner Failure** error message (error log message 30.01.42).

Hard drive

Before proceeding, remove the following components:

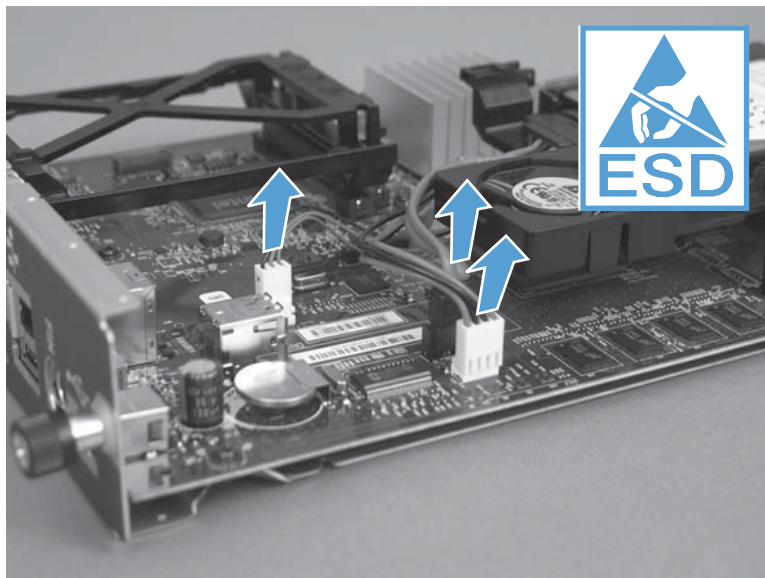
- Formatter PCA. See [Formatter PCA on page 106](#).

Remove the hard drive

 **CAUTION:**  ESD sensitive component.

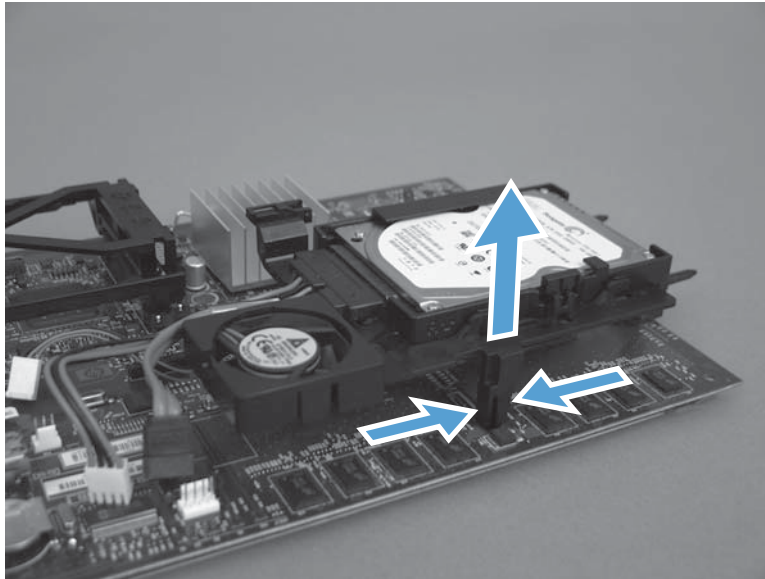
1. Disconnect three connectors.

Figure 2-17 Remove the hard drive (1 of 3)



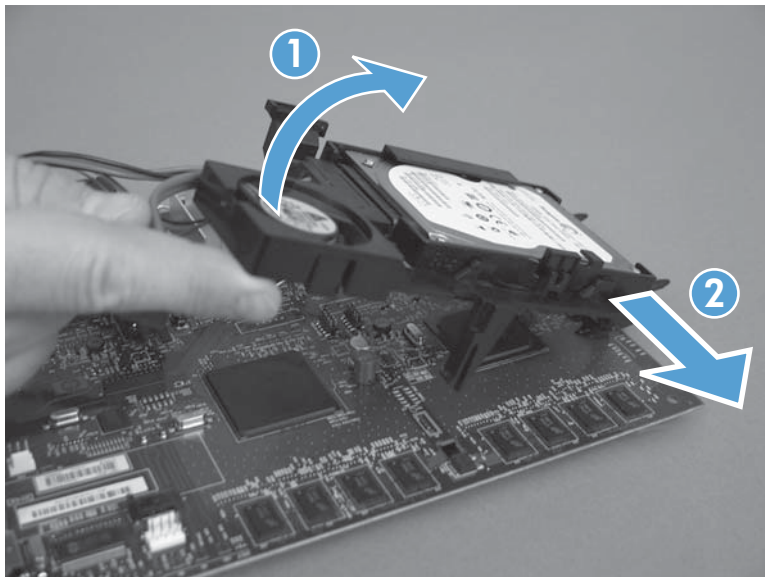
2. Release one tab.

Figure 2-18 Remove the hard drive (2 of 3)



3. Rotate the hard drive assembly away from the formatter until the slots in the hinges are aligned with the elongated hinge pins, and then slide the hard drive assembly off the hinge pins.


Figure 2-19 Remove the hard drive (3 of 3)




4. Upgrade the firmware to the new hard drive.

Upgrade the firmware


1. Go to www.hp.com/go/cljcm4540mfp_firmware and follow the onscreen steps to download the most recent firmware upgrade files for your product.
2. Copy the firmware update file to a portable USB flash memory storage device (thumb drive).

3. Reinstall the formatter with the new hard drive and reconnect the power cord and network connection.
4. Turn the product on.
5. Press and hold the Stop  button when all of the LEDs illuminate solid.
6. Press the 9 button to highlight the **Administrator** menu, and then press the 6 button.
7. Press the 9 button to highlight the **Download** menu, and then press the 6 button.
8. Insert the portable USB storage device with the firmware update file on it.

 **NOTE:** If the error message **No USB Thumbdrive Files Found** appears on the control-panel display, you might need to connect the storage device to the external USB connection on the formatter.

9. Press the 9 button to highlight the **USB Thumbdrive** menu, and then press the 6 button.
10. Press the 9 button to highlight the firmware update file, and then press the 6 button.

 **NOTE:** The upgrade process can take up to 10 minutes to complete.

 **TIP:** If there is more than one firmware update file on the storage device, make sure that you select the correct file for this product.

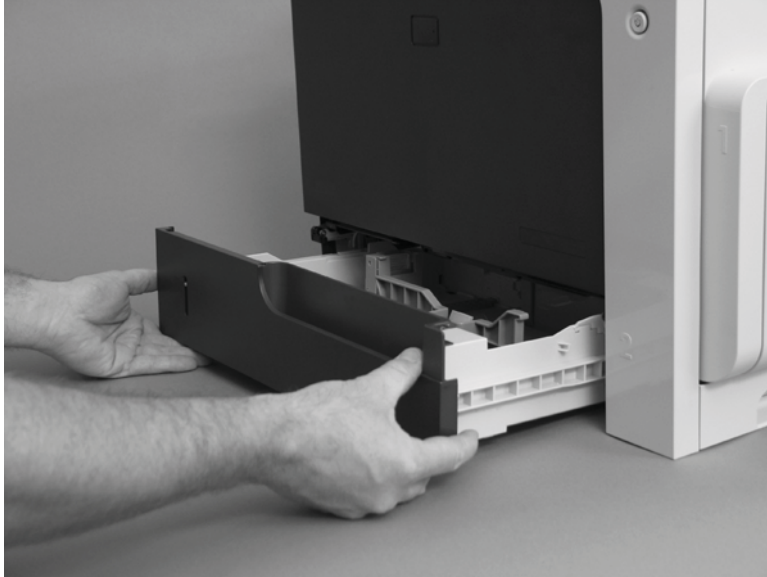
11. When the message **Complete** appears on the control-panel display, press the 5 button three times.
12. When the message **Continue** appears on the control-panel display, press the 6 button. The product will initialize.
13. When the upgrade process is complete, print a configuration page and verify that the upgrade firmware version was installed.

Tray

 **NOTE:** Use this procedure to remove Tray 2 and the optional Trays 3, 4, and 5.

1. Pull the tray straight out of the product until it stops.

Figure 2-20 Remove the tray (1 of 2)



2. Push the tray in slightly, carefully lift up to release it, and then remove the tray.

Figure 2-21 Remove the tray (2 of 2)



Fuser

CAUTION: The fuser might be hot. Allow enough time after turning off the product power for the fuser to cool.

NOTE: The product detects a new fuser using a fusible link that blows after 100 pages have been printed. If a new fuser is installed for troubleshooting purposes, be sure to remove it before printing 100 pages.

1. Open the right-door assembly.

Figure 2-22 Remove the fuser (1 of 2)



2. Grasp the handles and squeeze the blue release levers.
Pull the fuser straight out of the product to remove it.

Figure 2-23 Remove the fuser (2 of 2)



Feed and separation rollers (Trays 2-5)

⚠ CAUTION: Do not touch the spongy roller surface unless you are replacing the roller. Skin oils on the roller can cause paper pickup problems.

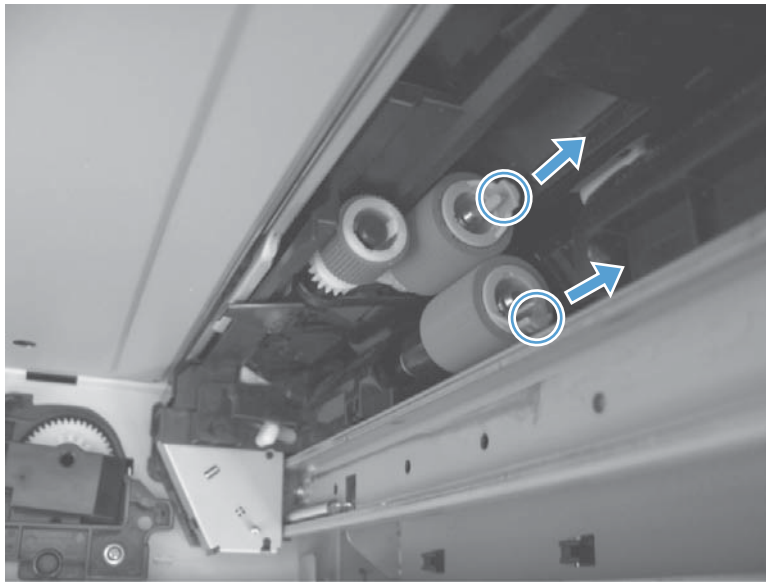
1. Locate the feed and separation rollers for the tray.

💡 TIP: You do not have to separate the product from the feeder to remove these rollers. Remove the cassette, and then reach up into the cavity to remove the rollers.

2. Release two tabs, and then remove the rollers.

💡 Reinstallation tip When you reinstall the rollers, make sure that the rollers snap into place.

Figure 2-24 Remove the Pickup and feed rollers (Trays 2-5)



Pickup roller (Tray 1)

⚠ CAUTION: Do not touch the spongy roller surface unless you are replacing the roller. Skin oils on the roller can cause paper pickup problems.

1. Open Tray 1.

Figure 2-25 Remove the pickup roller (Tray 1) (1 of 5)



2. Push the top edge of the cover to release the tabs.

Figure 2-26 Remove the pickup roller (Tray 1) (2 of 5)



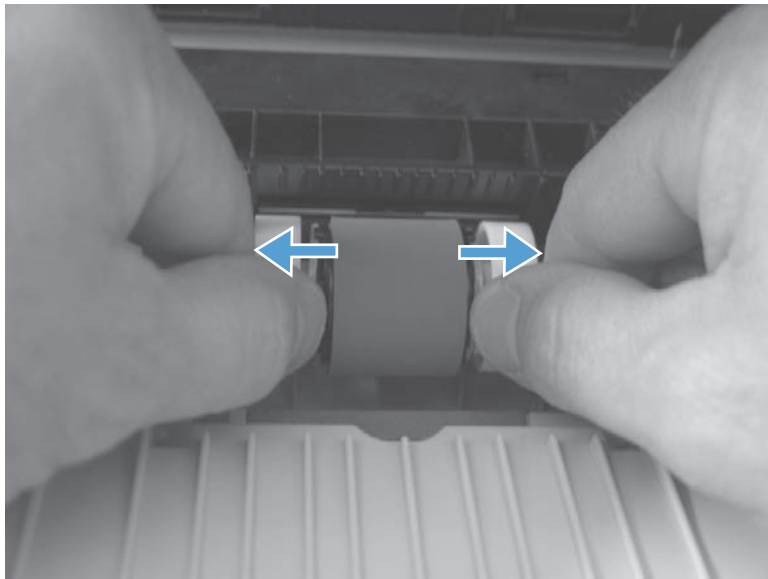
3. Open the right-door assembly, and then remove the cover.

Figure 2-27 Remove the pickup roller (Tray 1) (3 of 5)



4. Release the two blue tabs.

Figure 2-28 Remove the pickup roller (Tray 1) (4 of 5)



5. Rotate the roller body away from the product to remove it.

Figure 2-29 Remove the pickup roller (Tray 1) (5 of 5)



Reinstalling the pickup roller (Tray 1)

- ▲ When reinstalling the pickup roller, make sure the roller cover is installed correctly. Incorrect installation can cause paper to jam.

Figure 2-30 Incorrect position of cover

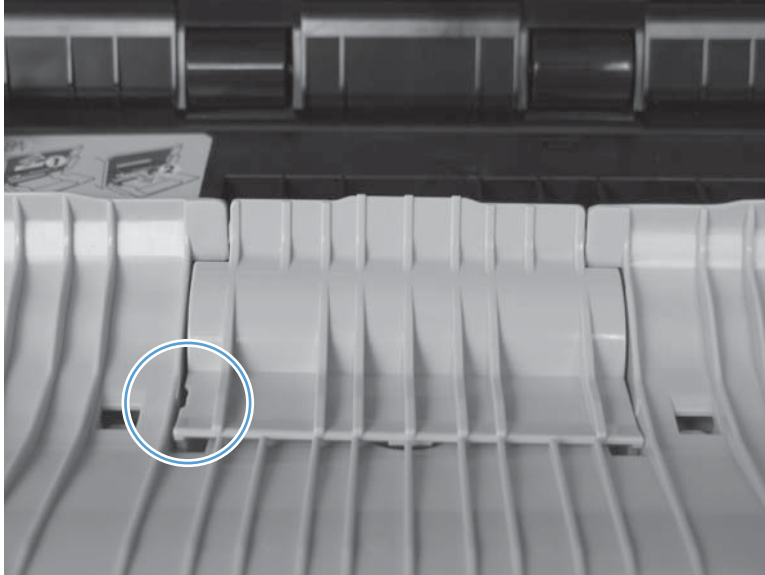
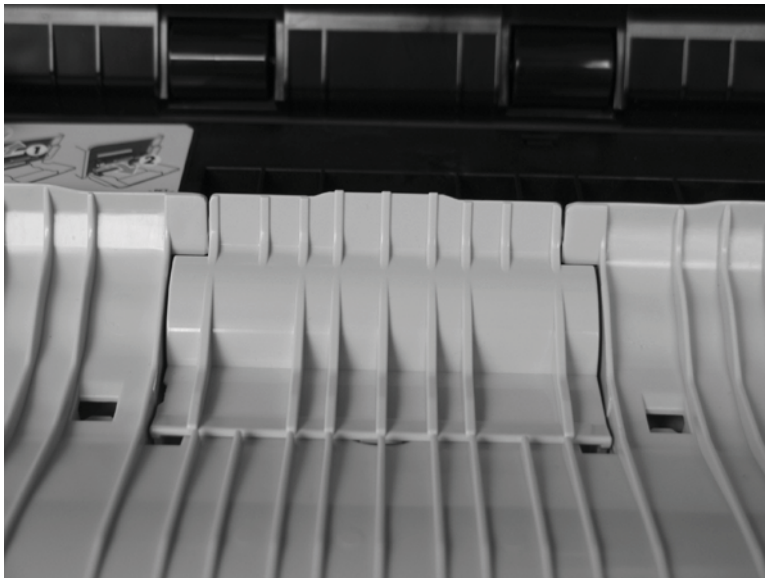


Figure 2-31 Correct position of cover



Secondary transfer roller

⚠ CAUTION: Do not touch the spongy roller surface unless you are replacing the roller. Skin oils on the roller can cause image quality problems.

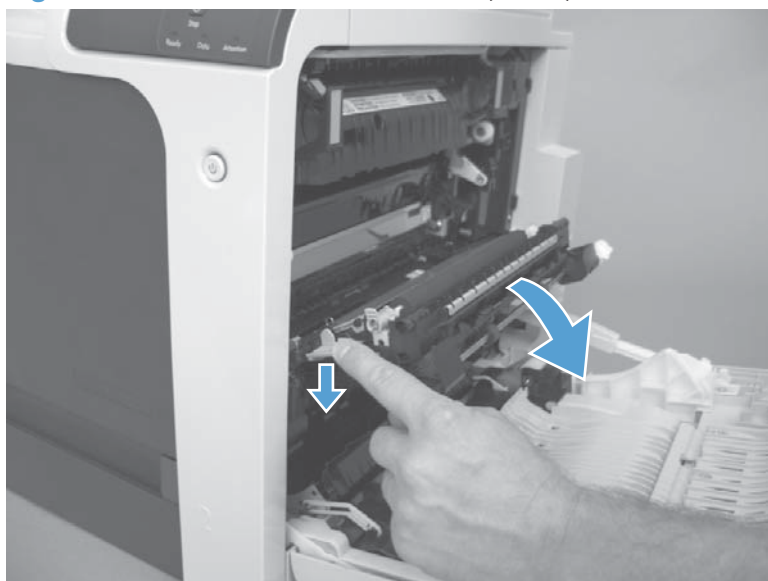
1. Open the right-door assembly.

Figure 2-32 Remove the transfer roller (1 of 3)



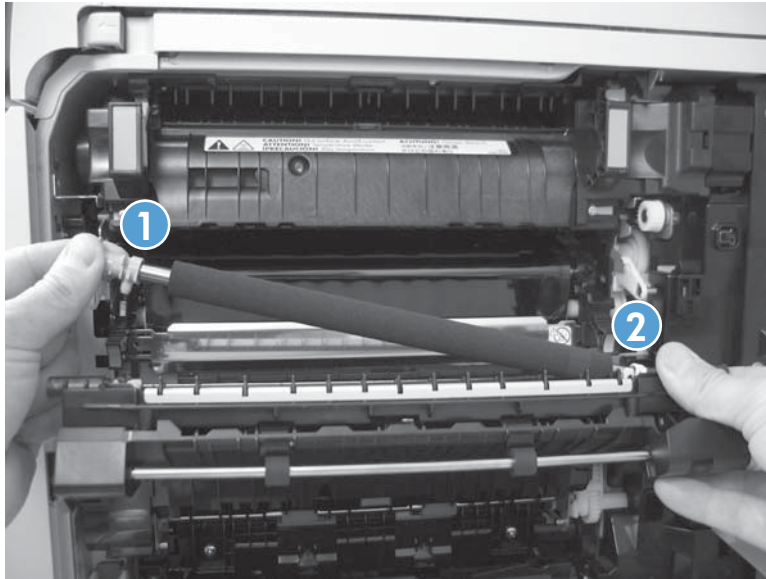
2. Use the blue lever to lower the secondary transfer assembly.

Figure 2-33 Remove the transfer roller (2 of 3)



3. Grasp the roller shaft collars, and lift the transfer roller off of the product.

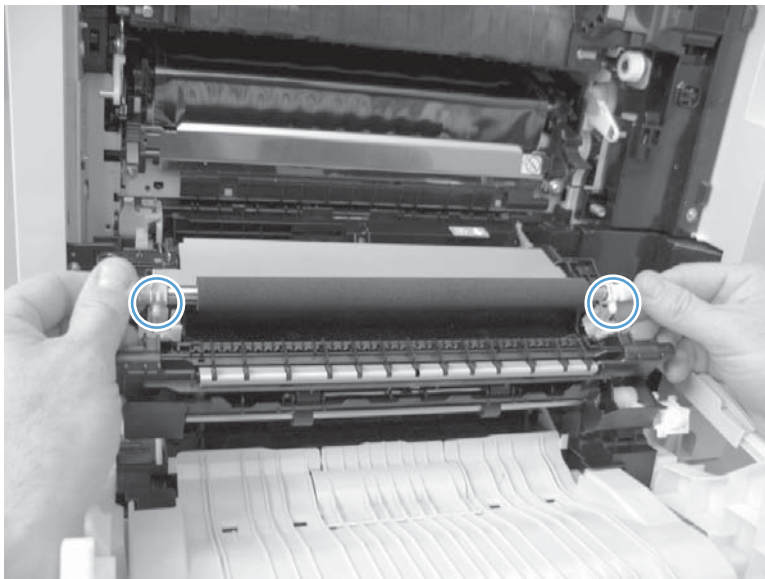
Figure 2-34 Remove the transfer roller (3 of 3)



Reinstall the transfer roller

When you reinstall the transfer roller, make sure that the pins on the shaft collars align with the holes in the mounting assembly. After installing the new transfer roller, remove the protective cover.

Figure 2-35 Reinstall the transfer roller



Intermediate transfer belt (ITB)

⚠ CAUTION: Do not touch the black-plastic belt. Skin oils and fingerprints on the belt can cause print-quality problems. Always place the ITB on a flat surface in a safe and protected location.

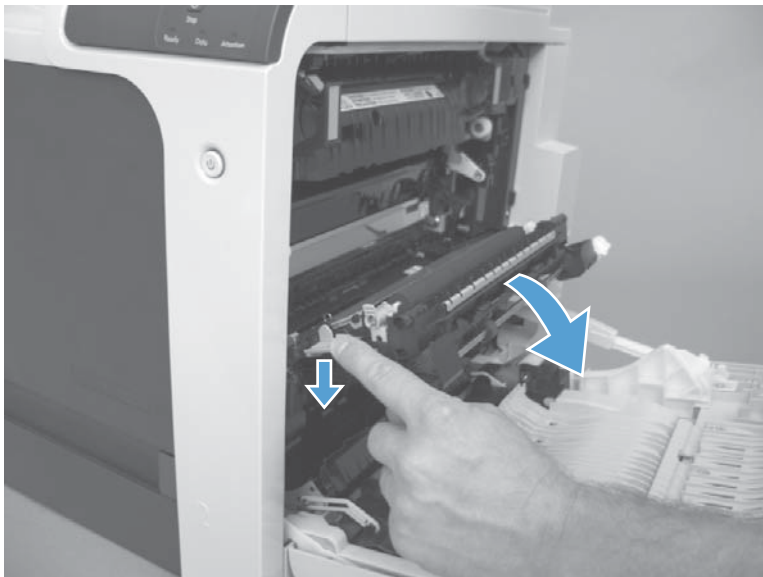
1. Open the right-door assembly.

Figure 2-36 Remove the intermediate transfer belt (1 of 4)



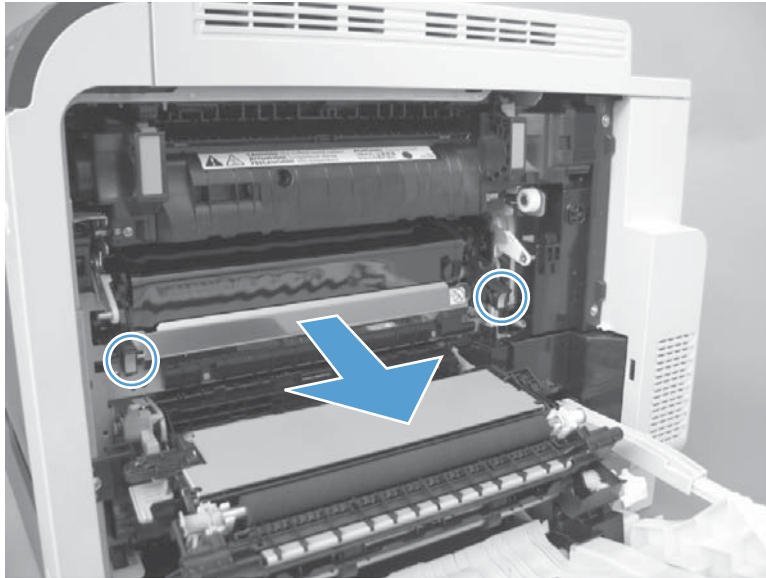
2. Use the blue lever to lower the secondary transfer assembly.

Figure 2-37 Remove the intermediate transfer belt (2 of 4)



3. Grasp the small handles on the ITB and then pull the ITB out of the product until two large handles expand along the right- and left-side of the ITB.

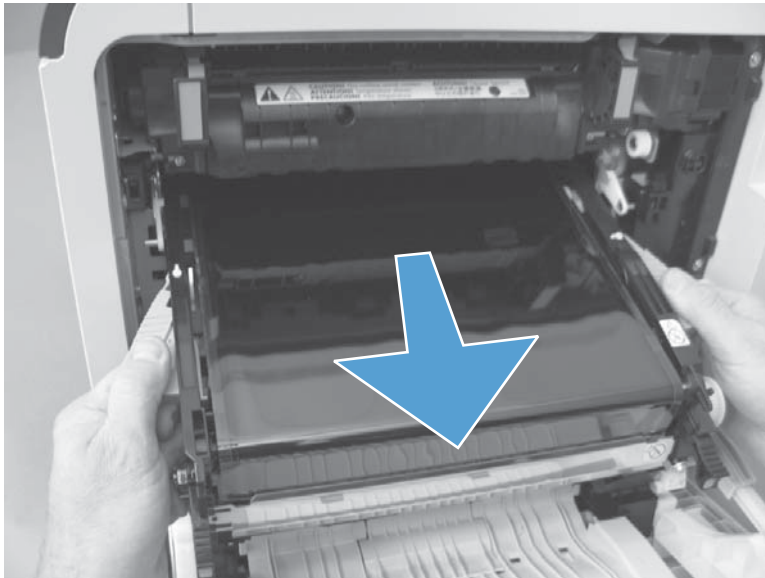
Figure 2-38 Remove the intermediate transfer belt (3 of 4)



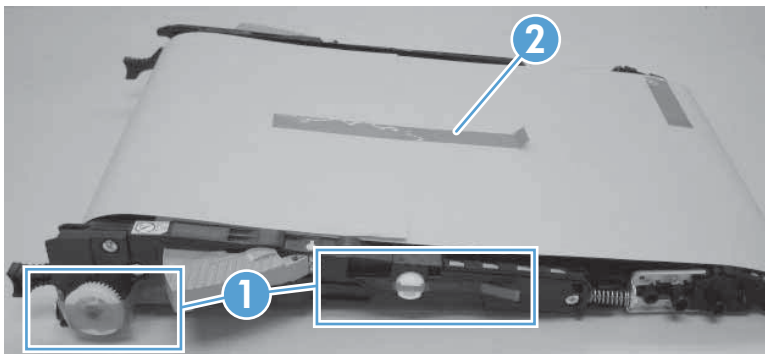
4. Grasp the large handles on the ITB and then pull the ITB straight out of the product to remove it.

CAUTION: The ITB is a sensitive component. Be careful when handling the ITB so that it is not damaged. Always place the ITB in a safe and protected location.

Figure 2-39 Remove the intermediate transfer belt (4 of 4)



Reinstallation tip If you are installing a replacement ITB, make sure that you remove the packing tape (callout 1) and the protective cover sheet (callout 2).



Standard output bin

- ▲ Lift and pull the output bin to remove.

Figure 2-40 Remove the standard output bin



Output bin bezel

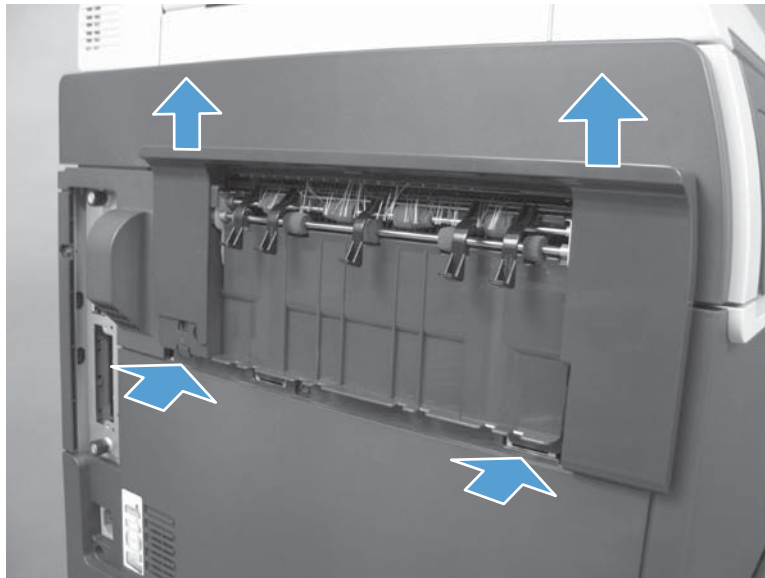
Before proceeding, remove the following components:

- Standard output bin. See [Standard output bin on page 123](#)

Remove the output bin bezel

- ▲ Release two latches, and then slide the bezel up to remove.

Figure 2-41 Remove output bin bezel



ASY-TRY-F-BASE-SP (document feeder tray extender)

- ▲ Pull the tray extender out, lift, and then remove.

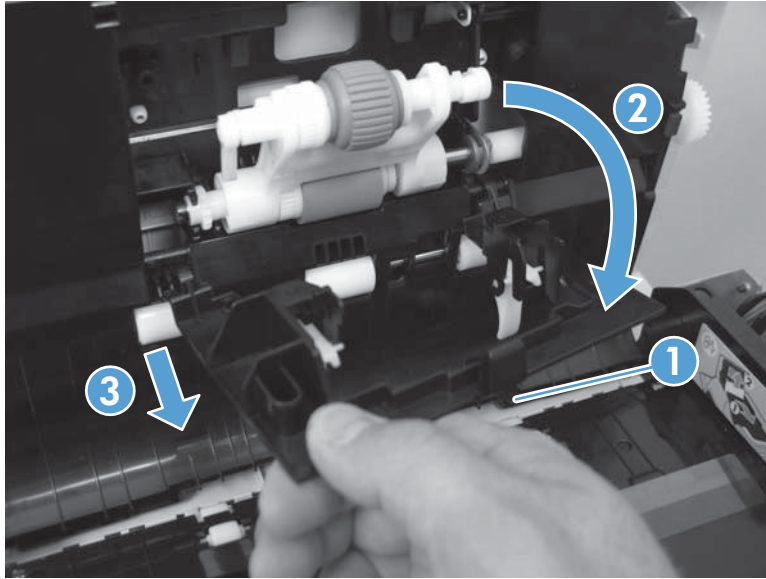
Figure 2-42 Remove the document feeder tray extender



ASY-CVR-FE-PICK-SP (pickup roller cover)

1. Open the jam access cover.
2. Release the cover latch (callout 1). Lower the cover (callout 2) and then pull (callout 3) the cover to remove.

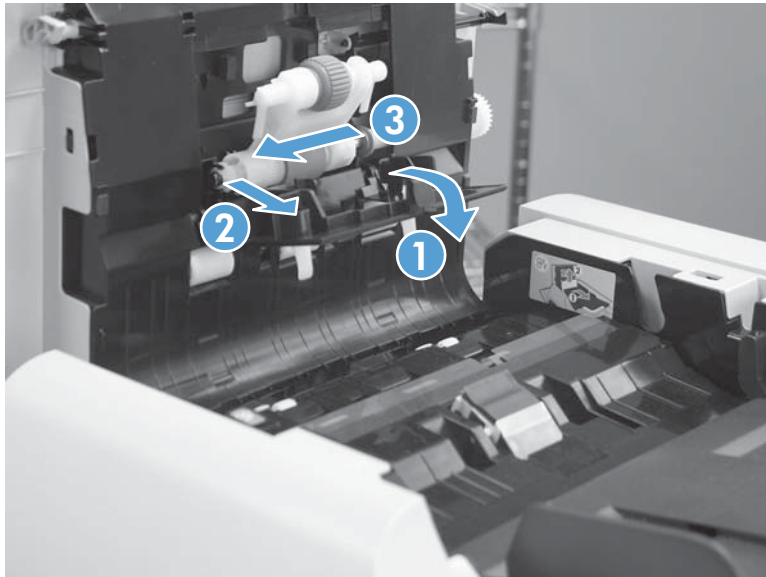
Figure 2-43 Remove the ASY-CVR-FE-PICK-SP (pickup roller cover)



ASY-ROL-FE-FEED-SP (pickup roller)

- ▲ Open the jam access cover (callout 1). Release the left side of the roller (callout 2) and remove (callout 3).

Figure 2-44 Remove the ASY-CVR-FE-PICK-SP (pickup roller cover)



ASY-HLD-REV-PAD-SP (pickup roller pad) and ASY-SP-REV-SPR (spring)

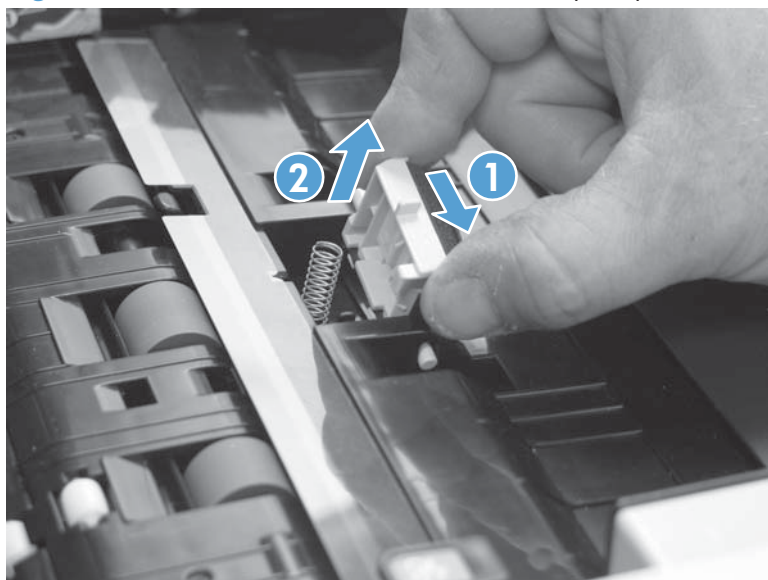
1. Open the jam access cover.
2. Release one tab.

Figure 2-45 Remove the ASY-CVR-FE-PICK-SP (pickup roller cover)



3. Slide the pad (callout 1) and then lift back edge to remove (callout 2). Remove the spring if necessary.

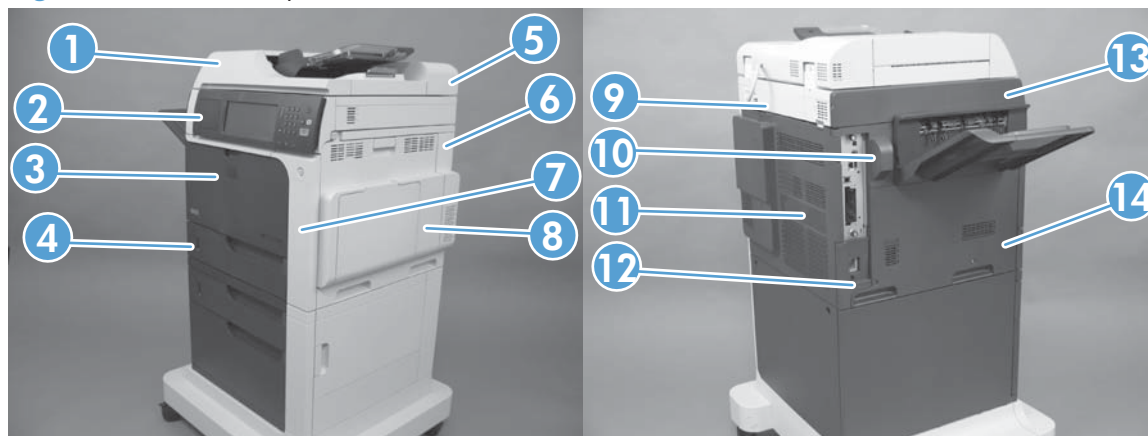
Figure 2-46 Remove the ASY-CVR-FE-PICK-SP (pickup roller cover)



External panels, covers, and doors

Identification and location

Figure 2-47 External panels, covers, and doors; identification and location



Item	Description	Item	Description
1	ASY-CVR-F-SP (document feeder front cover) (see ASY-CVR-F-SP (document feeder front cover) on page 129)	8	Right-door assembly (see Right-door assembly on page 145)
2	Control-panel assembly (see Control panel on page 100).	9	Rear top cover (see S-CVR-REAR (scanner rear cover) on page 128)
3	Front-door assembly (see Front-door assembly on page 140)	10	Fan cover (see Fan cover on page 134)
4	Tray (see Tray on page 111)	11	Rear cover (see Rear cover on page 144)
5	ASY-CVR-F-R-SP (document feeder rear cover) (see ASY-CVR-F-R-SP (document feeder rear cover) on page 131)	12	Lower-left cover (see Lower-left cover on page 136)
6	Right-rear cover (see Right-rear cover on page 143)	13	S-CVR-LEFT (scanner left cover) (see S-CVR-LEFT (scanner left cover) on page 133)
7	Right-front cover (see Right-front cover on page 138)	14	Left cover (see Left cover on page 137)

S-CVR-REAR (scanner rear cover)

1. Remove one screw.

Figure 2-48 Remove S-CVR-REAR (scanner rear cover) (1 of 2)



2. Release one tab, and then remove the scanner cover.

Figure 2-49 Remove S-CVR-REAR (scanner rear cover) (2 of 2)



ASY-CVR-F-SP (document feeder front cover)

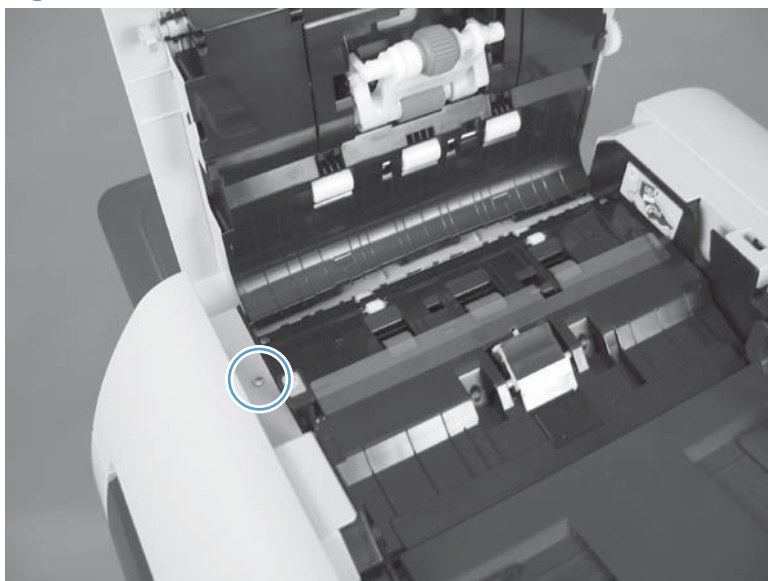
1. Lift the jam cover.

Figure 2-50 Remove ASY-CVR-F-SP (document feeder front cover) (1 of 4)



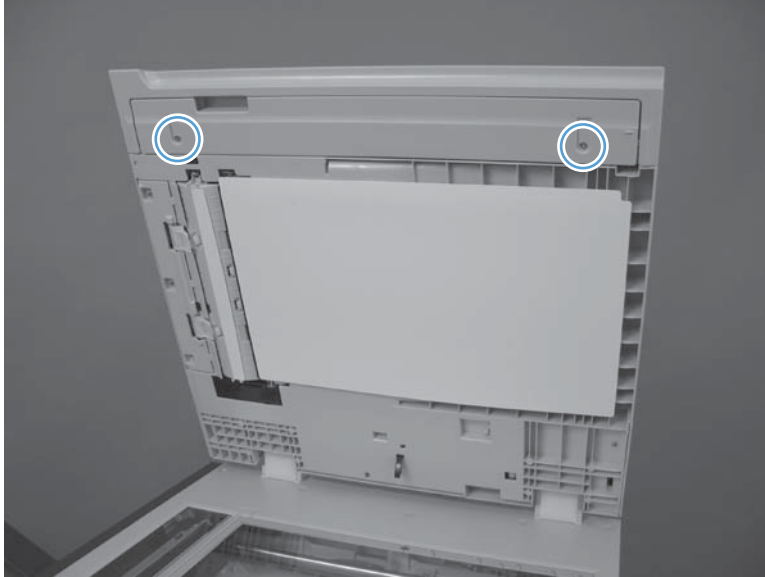
2. Remove one screw.

Figure 2-51 Remove ASY-CVR-F-SP (document feeder front cover) (2 of 4)



3. Open the document feeder and then remove two screws.

Figure 2-52 Remove ASY-CVR-F-SP (document feeder front cover) (3 of 4)



4. Close the document feeder and then remove the document feeder front cover.

Figure 2-53 Remove ASY-CVR-F-SP (document feeder front cover) (4 of 4)



ASY-CVR-F-R-SP (document feeder rear cover)

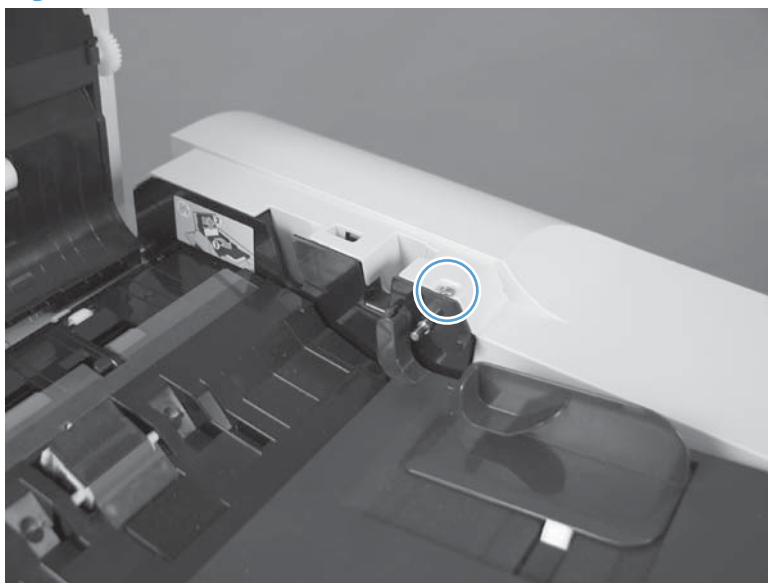
1. Open the jam cover.

Figure 2-54 Remove the ASY-CVR-F-R-SP (document feeder rear cover) (1 of 5)



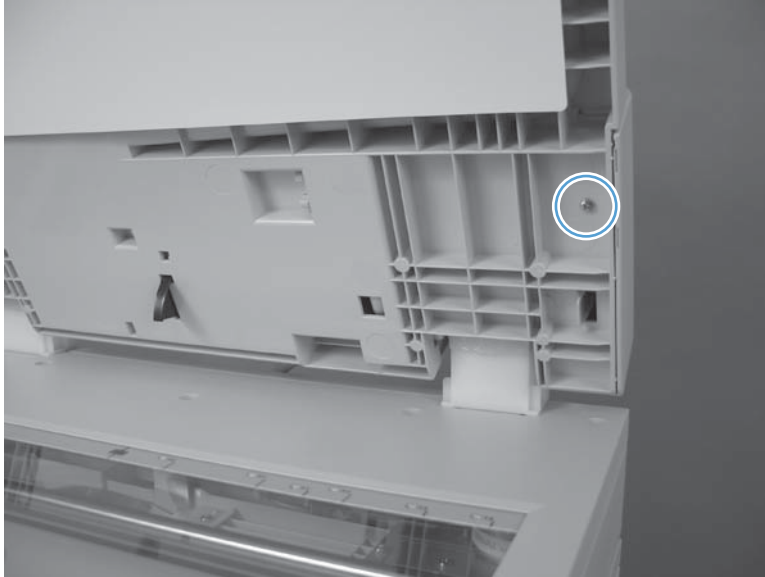
2. Remove one screw.

Figure 2-55 Remove the ASY-CVR-F-R-SP (document feeder rear cover) (2 of 5)



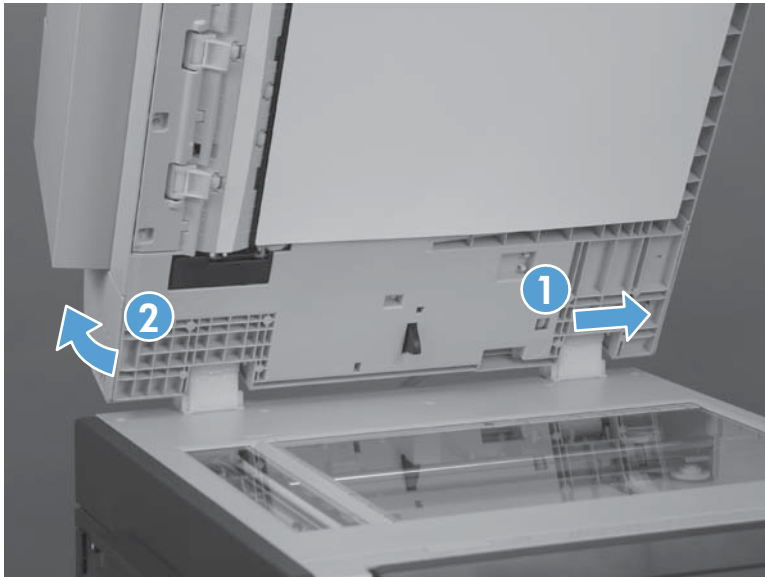
3. Open the document feeder and then remove one screw.

Figure 2-56 Remove the ASY-CVR-F-R-SP (document feeder rear cover) (3 of 5)



4. Release one tab (callout 1) and then lift the document feeder rear cover (callout 2).

Figure 2-57 Remove the ASY-CVR-F-R-SP (document feeder rear cover) (4 of 5)



5. Remove the document feeder rear cover.

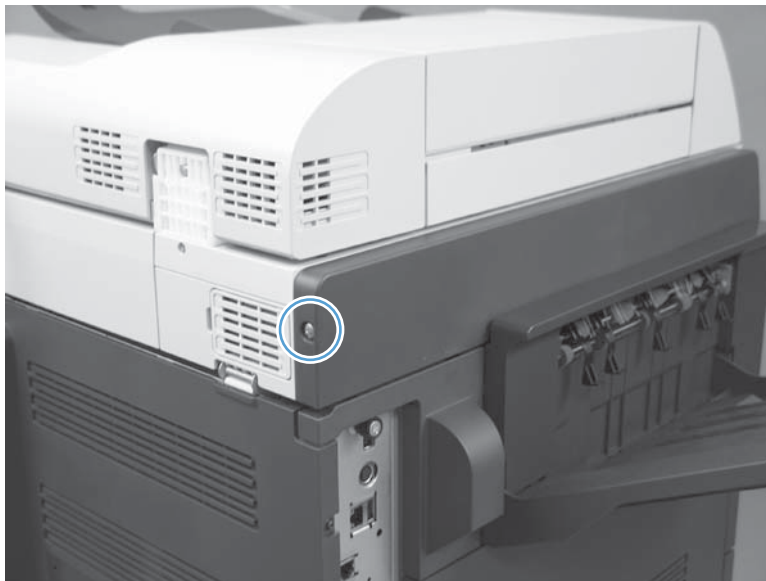
Figure 2-58 Remove the ASY-CVR-F-R-SP (document feeder rear cover) (5 of 5)



S-CVR-LEFT (scanner left cover)

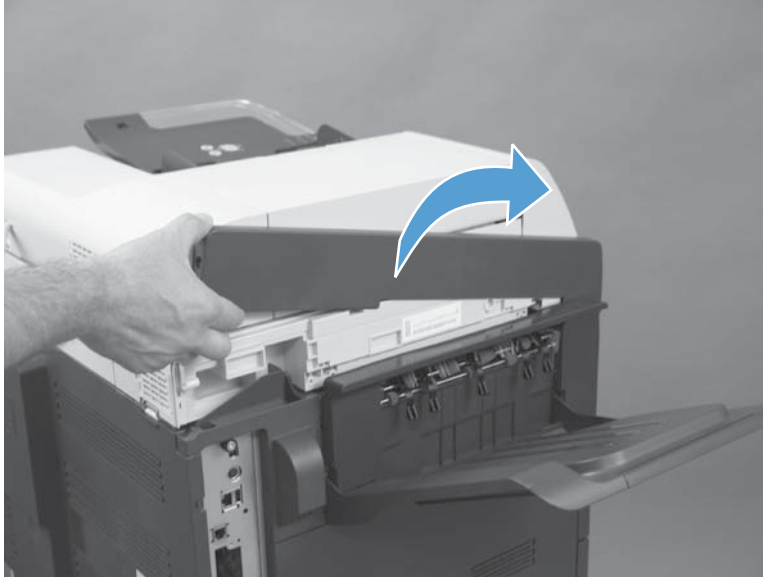
1. Remove one screw.

Figure 2-59 Remove S-CVR-LEFT (scanner left cover) (1 of 2)



2. Lift the scanner left cover to remove.

Figure 2-60 Remove S-CVR-LEFT (scanner left cover) (2 of 2)



Fan cover

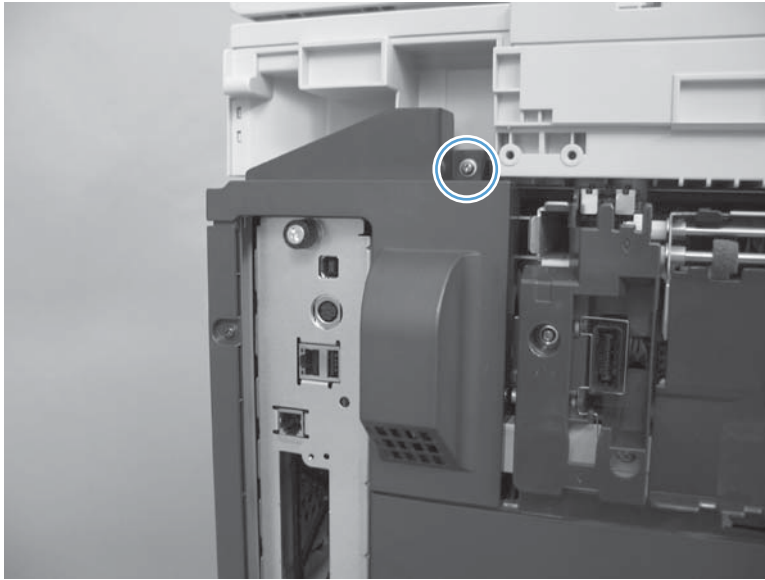
Before proceeding, remove the following components:

- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).

Remove the fan cover

- ▲ Remove one screw and then remove the fan cover.

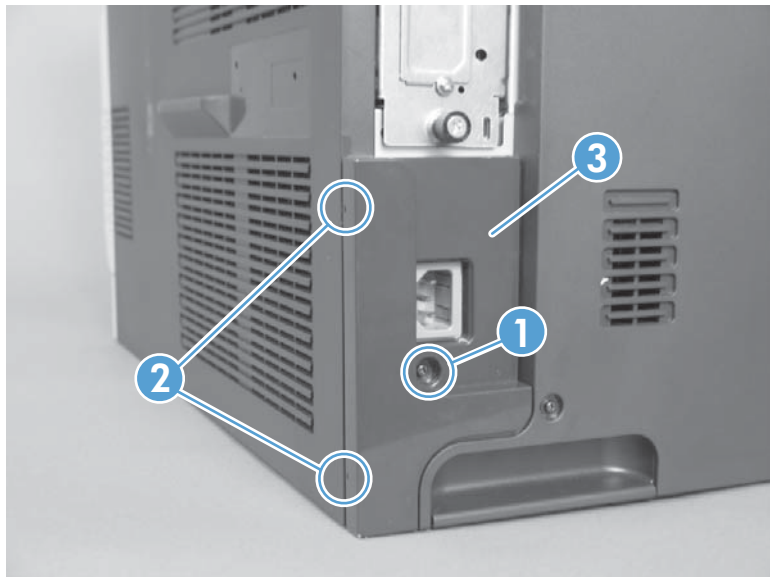
Figure 2-61 Remove upper left cover



Lower-left cover

- ▲ Remove one screw (callout 1), release two tabs (callout 2), and then remove the lower-left cover (callout 3).

Figure 2-62 Remove the lower-left cover



Left cover

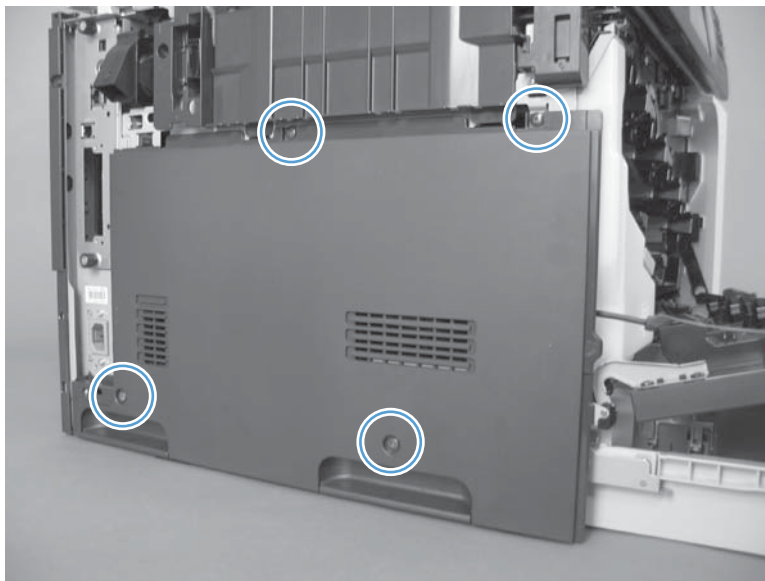
Before proceeding, remove the following components:

- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).

Remove the left cover

1. Open the front-door assembly. Open or remove Tray 2.
2. Remove four screws, and then remove the left cover.

Figure 2-63 Remove the left cover



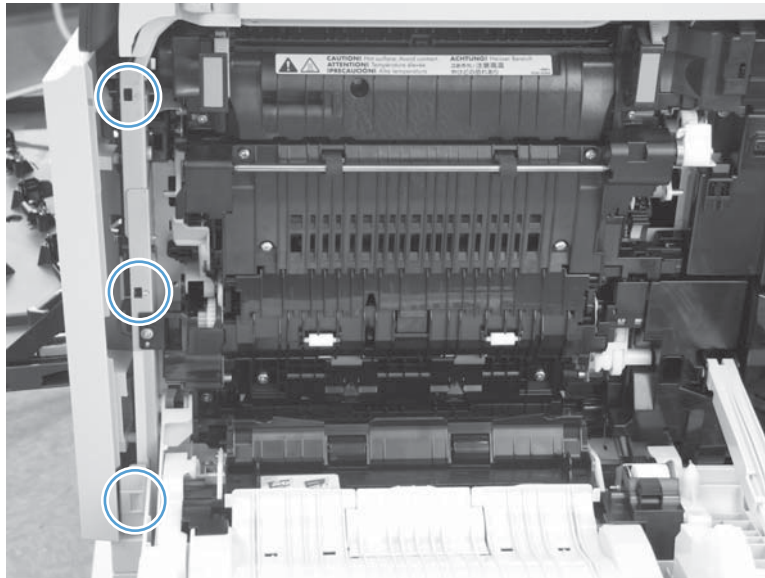
Right-front cover

Remove the right-front cover

 **NOTE:** Be careful. When removing the cover, do not dislodge the power button. If the button is dislodged, see [Reinstall the power button on page 139](#) to reinstall it.

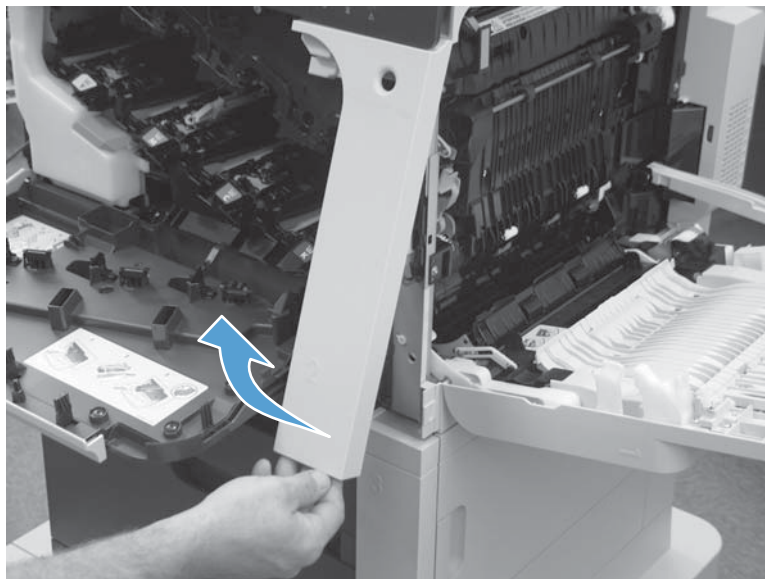
1. Open the right-door and front door assemblies.
2. Release three tabs.

Figure 2-64 Remove the right-front cover (1 of 2)



3. Lift the right-front cover to remove

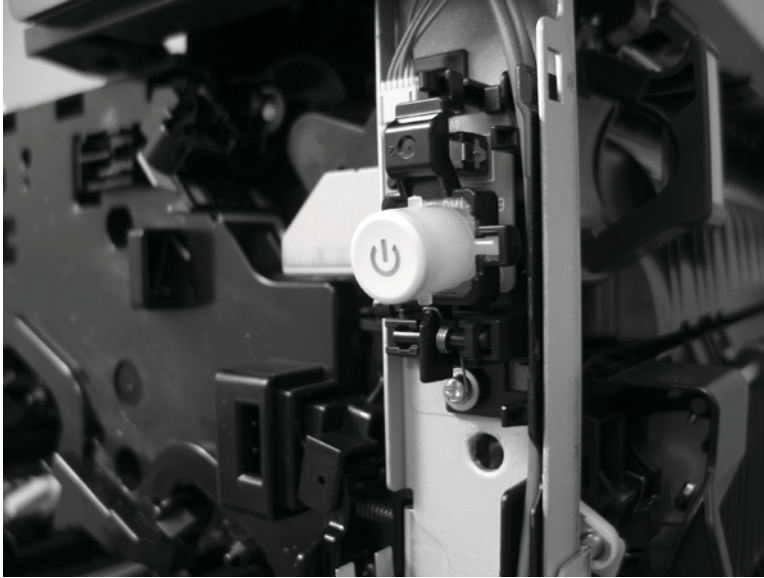
Figure 2-65 Remove the right-front cover (2 of 2)



Reinstall the power button

Snap the power button into the holders on the cover. Make sure that the spring is correctly installed.

Figure 2-66 Reinstall the power button



Front-door assembly

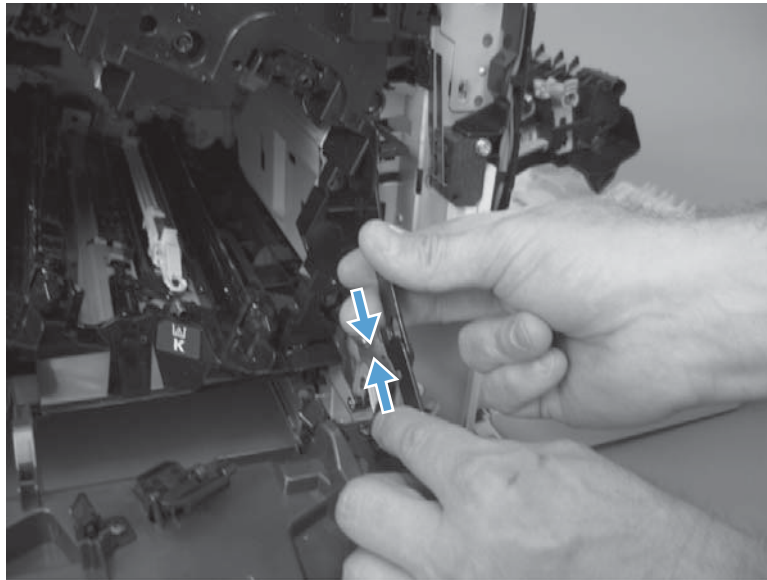
Before proceeding, remove the following components:

- Right-front cover. See [Right-front cover on page 138](#)

Remove the front-door assembly

1. Open the front-door assembly.
2. Release the right link arm by pushing the two segments together and then releasing.

Figure 2-67 Remove the front-door assembly (1 of 5)



3. Squeeze the tab on the left link arm using needle nose pliers to release it from the front door assembly.


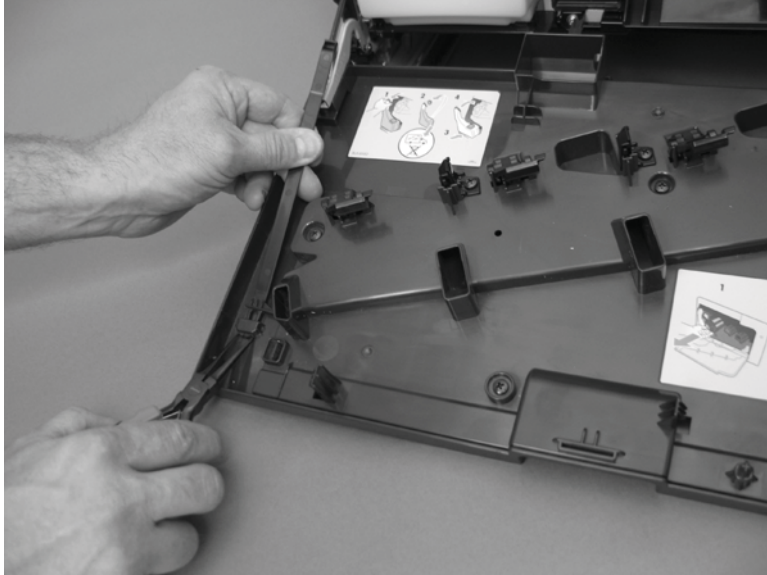
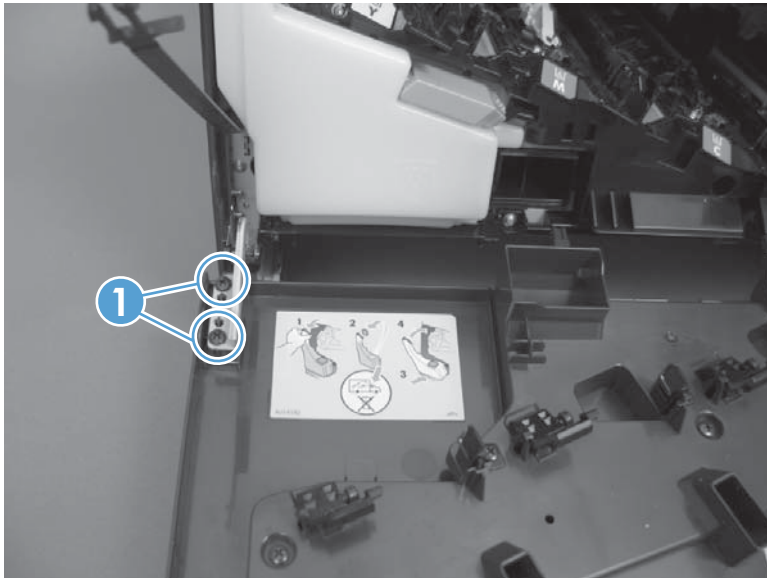
 **NOTE:** Hold the link arm firmly when releasing to prevent it from snapping against the front of the product.

Figure 2-68 Remove the front-door assembly (2 of 5)



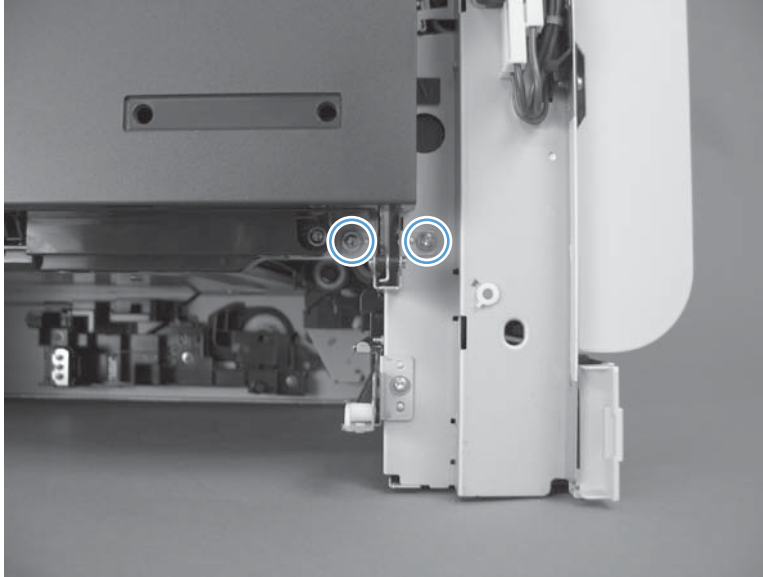
4. Remove two screws (callout 1).

Figure 2-69 Remove the front-door assembly (3 of 5)



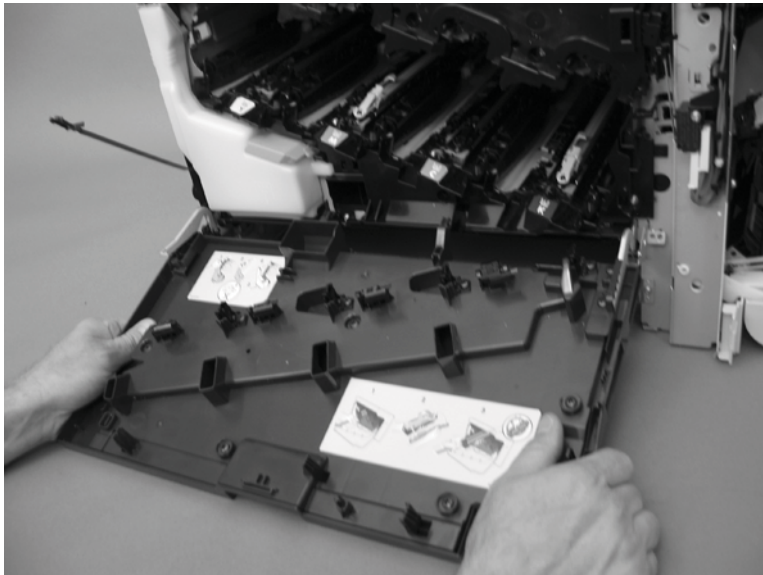
5. Remove two screws.

Figure 2-70 Remove the front-door assembly (4 of 5)



6. Remove the front-door assembly.

Figure 2-71 Remove the front-door assembly (5 of 5)



Right-rear cover

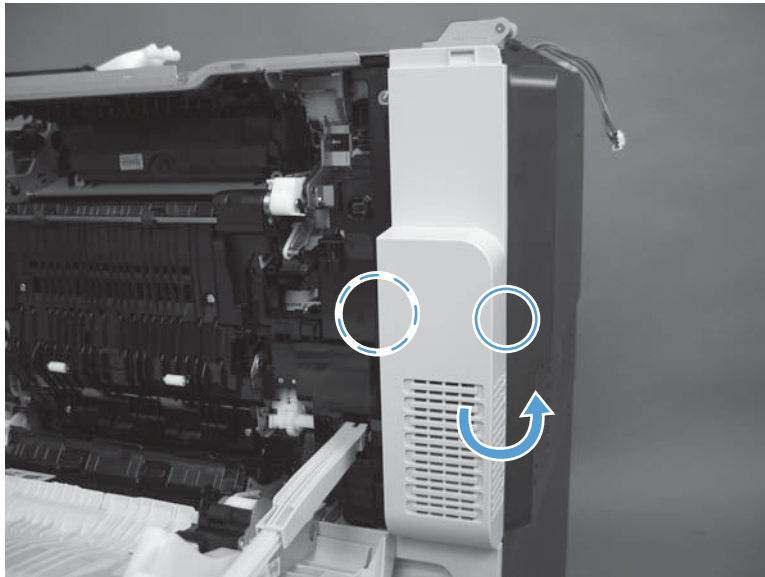
Before proceeding, remove the following components:

- Document feeder. See [Document feeder on page 151](#).
- Standard output bin. See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Scanner assembly. See [Scanner on page 170](#).
- Intermediate cover and duplexing gear cover. See [Intermediate cover and duplexing gear cover on page 229](#).

Remove the right-rear cover

1. Open the right-door assembly.
2. Release two tabs and rotate the cover to remove.

Figure 2-72 Remove the right-rear cover



Rear cover

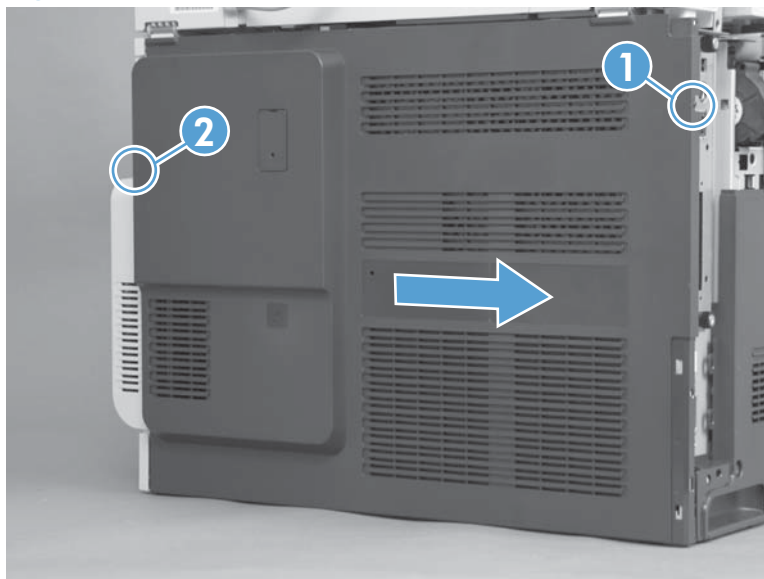
Before proceeding, remove the following components:

- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).

Remove the rear cover

- ▲ Remove one screws (callout 1), release one tab (callout 2), and then slide the cover to the right to remove.

Figure 2-73 Remove the rear cover



Right-door assembly

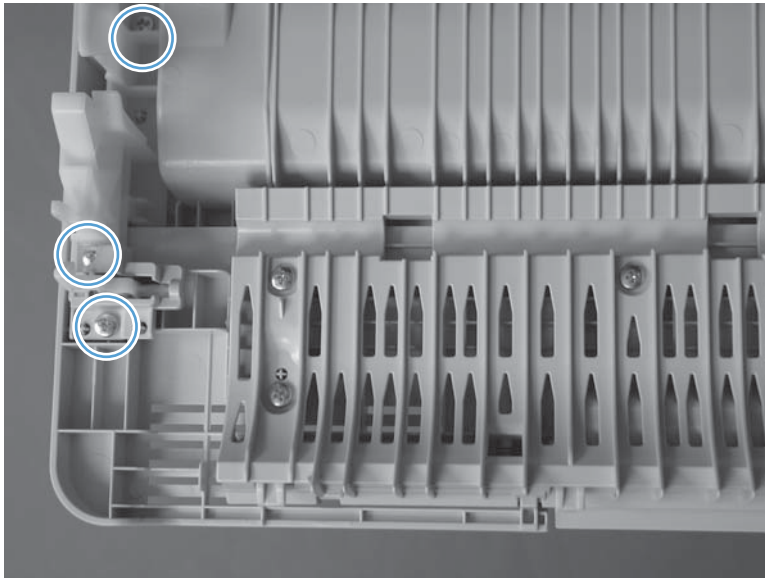
1. Open the right-door assembly.

Figure 2-74 Remove the right-door assembly (1 of 9)



2. Remove three screws.

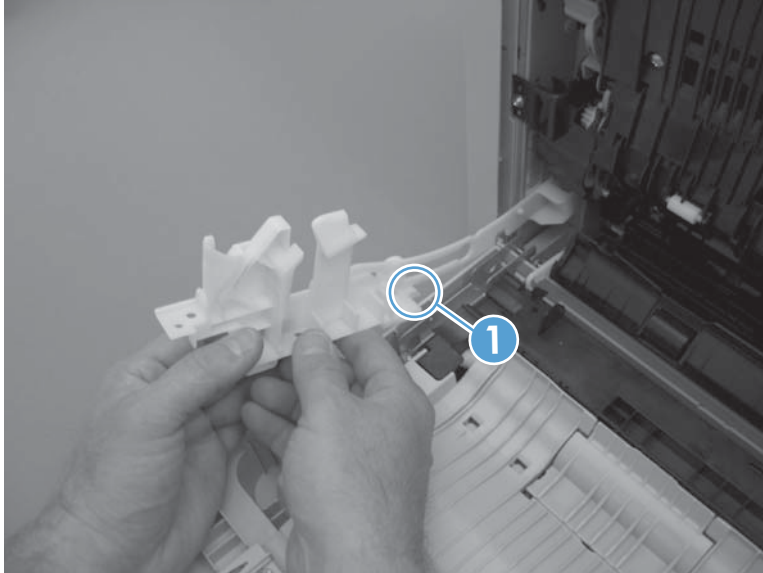
Figure 2-75 Remove the right-door assembly (2 of 9)



3. Remove the hinge assembly.

 **Reinstallation tip** When the hinge is reinstalled, make sure that the tab (callout 1) is correctly positioned on the door.

Figure 2-76 Remove the right-door assembly (3 of 9)



4. Remove the hinge cover.

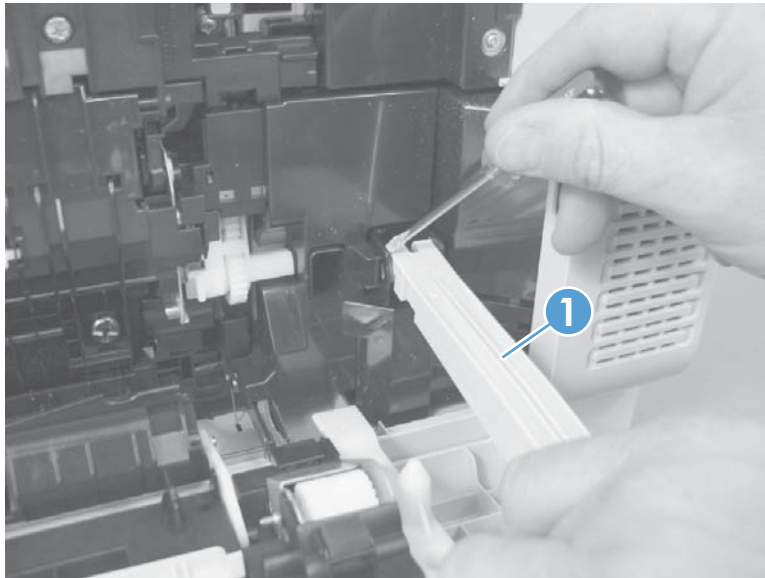
Figure 2-77 Remove the right-door assembly (4 of 9)



5. Release one pin, and then release the link arm (callout 1).

⚠ CAUTION: The link arm is spring loaded. Hold the arm securely (as shown) to prevent the spring from abruptly retracting.

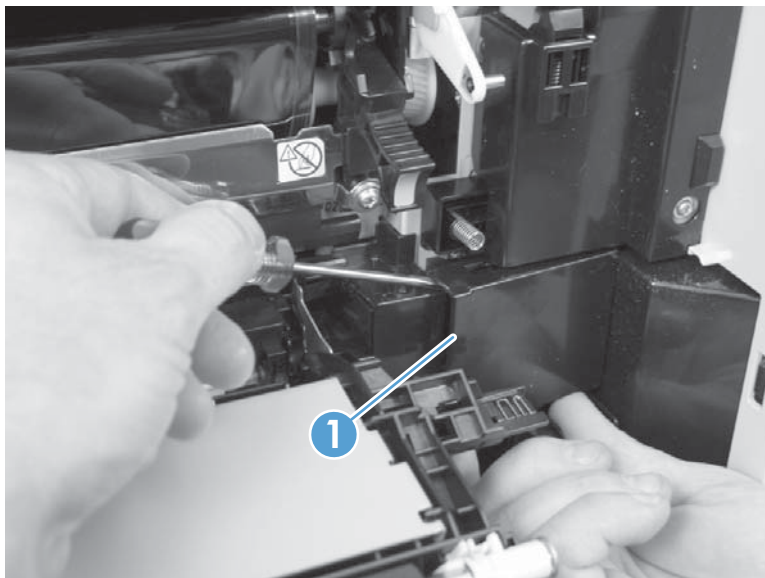
Figure 2-78 Remove the right-door assembly (5 of 9)



6. Release one tab, and then remove the cover (callout 1).

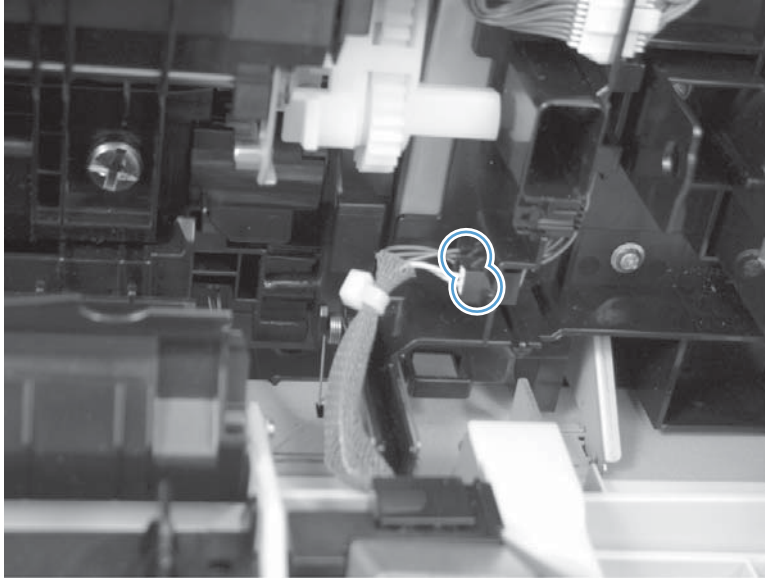
💡 TIP: Lift up on the secondary transfer assembly to make removing the cover easier.

Figure 2-79 Remove the right-door assembly (6 of 9)



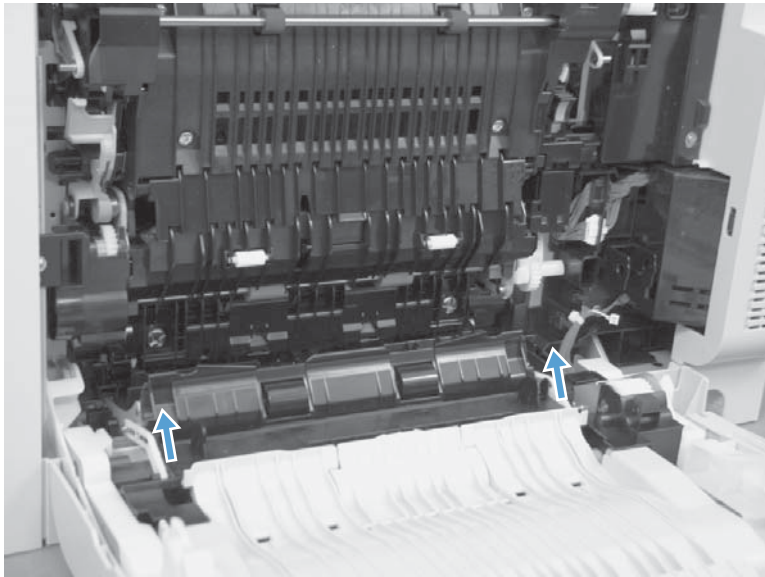
7. Disconnect two connectors.

Figure 2-80 Remove the right-door assembly (7 of 9)



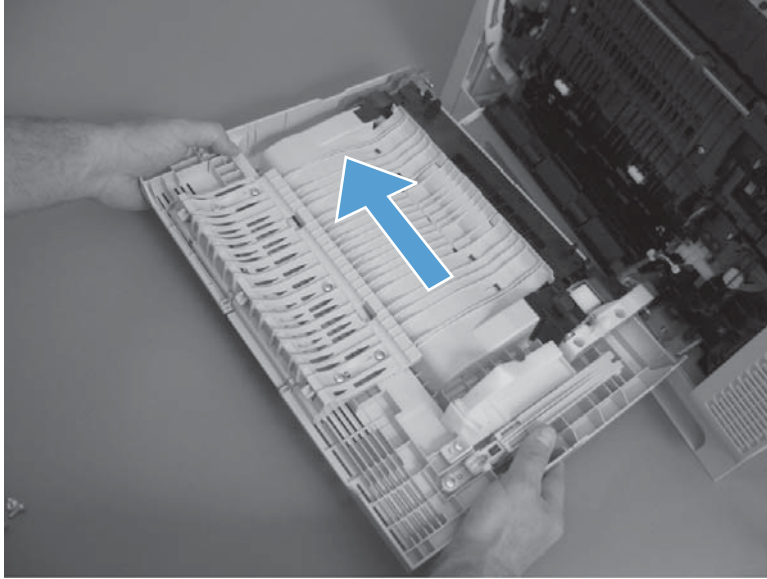
8. Lift two link arms to release.

Figure 2-81 Remove the right-door assembly (8 of 9)



9. Slide the right-door assembly toward the front of the product and remove.

Figure 2-82 Remove the right-door assembly (9 of 9)

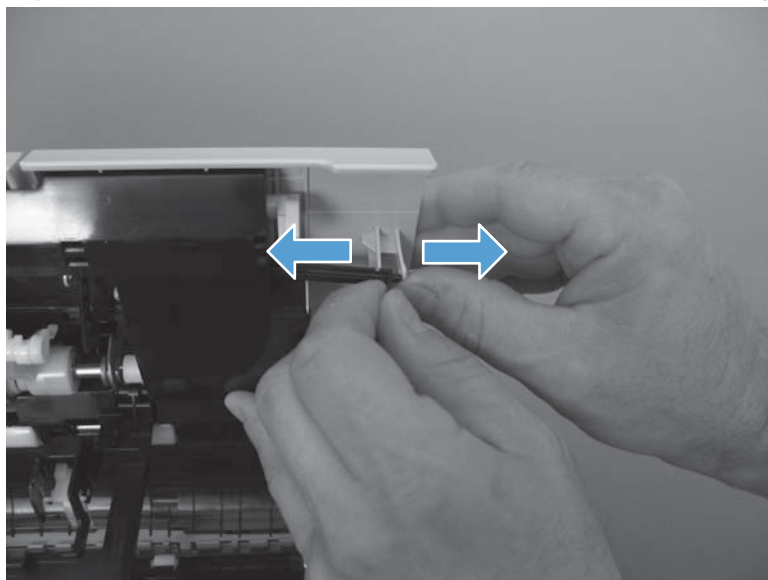


Document feeder

ASY-LVR-FE-EMP-SP (paper present flag)

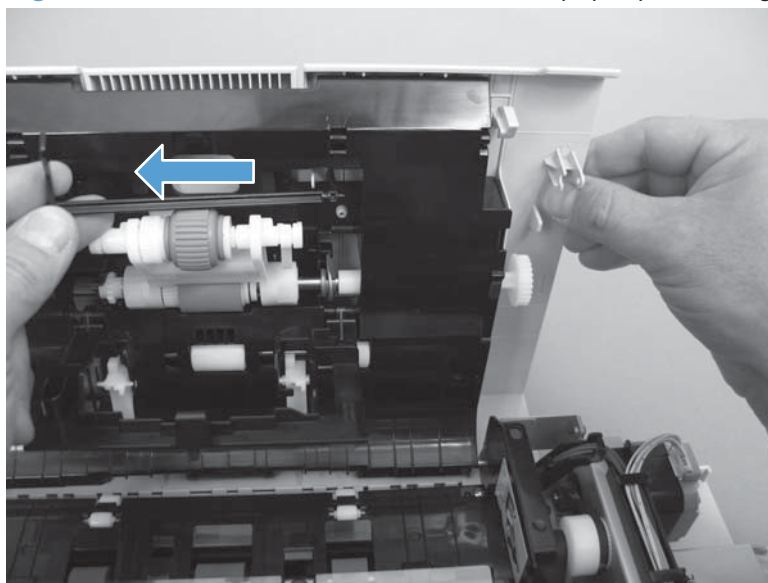
1. Open the jam access cover.
2. Release the flag from the hinge.

Figure 2-83 Remove the ASY-LVR-FE-EMP-SP (paper present flag) (1 of 2)



3. Pull the flag to release and remove.

Figure 2-84 Remove the ASY-LVR-FE-EMP-SP (paper present flag) (2 of 2)



Document feeder

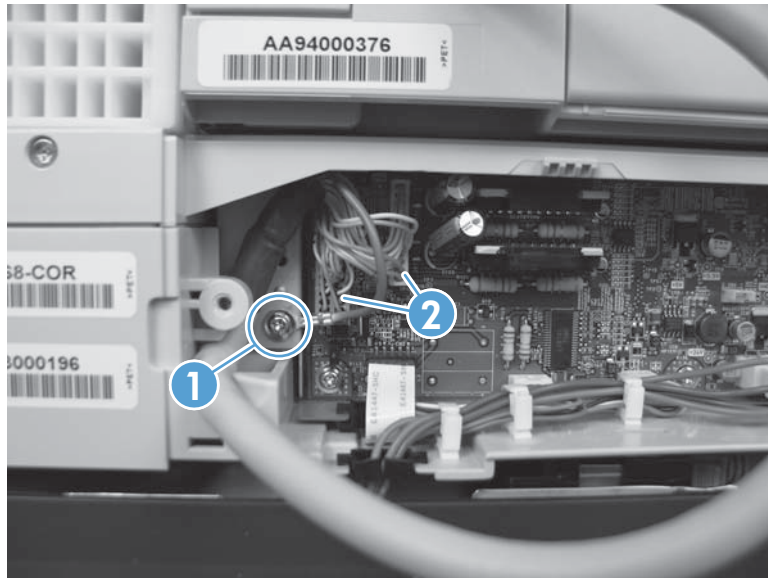
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).

Remove the document feeder

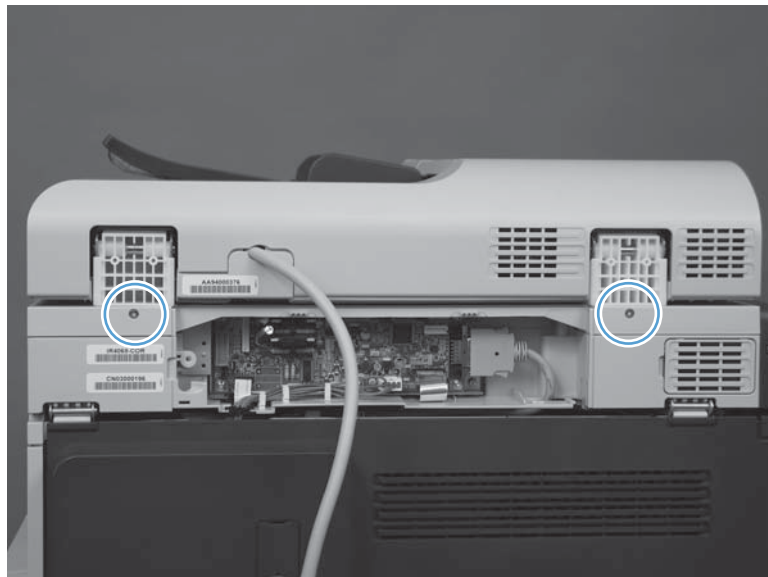
1. Remove one screw (callout 1) and disconnect two connectors (callout 2).

Figure 2-85 Remove the document feeder (1 of 3)



2. Remove two screws.

Figure 2-86 Remove the document feeder (2 of 3)



3. From the rear of the product, lift the document feeder to remove.

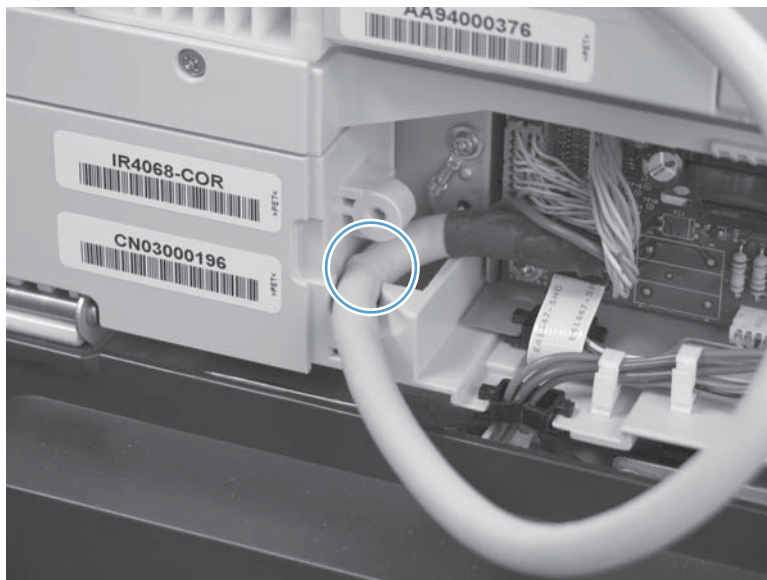
Figure 2-87 Remove the document feeder (3 of 3)



Reinstall the document feeder

- ▲ Make sure the cable retainer is installed inside the cavity.

Figure 2-88 Reinstall the document feeder



ASY-CVR-FE-FEED-SP (document feeder jam-access cover)

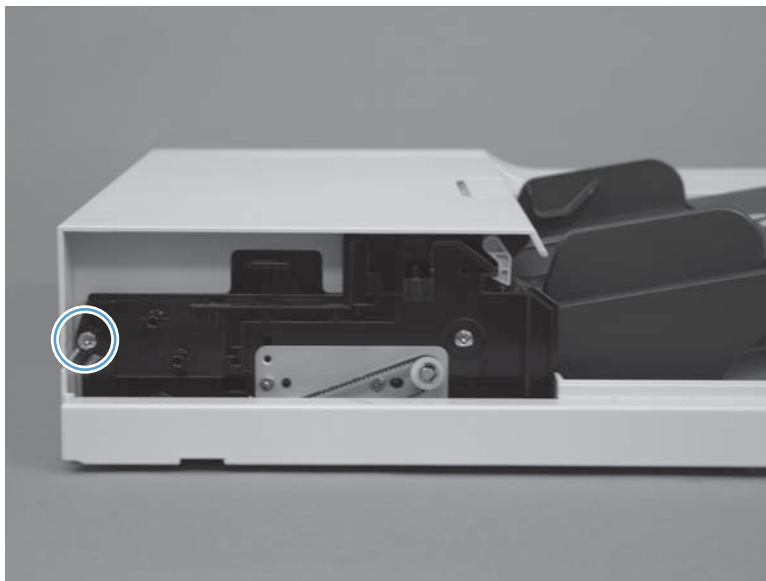
Before proceeding, remove the following components:

- ASY-CVR-F-SP (document feeder front cover). See [ASY-CVR-F-SP \(document feeder front cover\) on page 129](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).

Remove the ASY-CVR-FE-FEED-SP (document feeder jam-access cover)

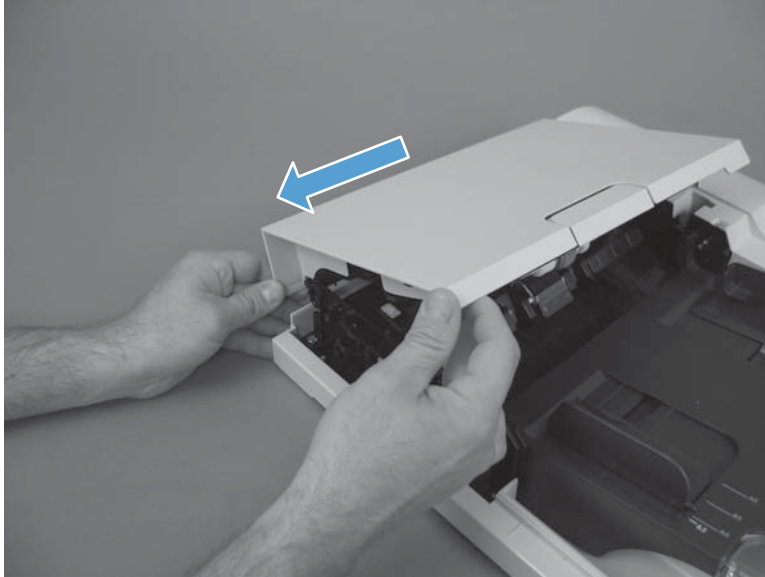
1. Remove one stepped screw.

Figure 2-89 Remove the ASY-CVR-FE-FEED-SP (document feeder jam-access cover) (1 of 2)



2. Lift the cover slightly, and then pull the cover toward the front of the product to remove.

Figure 2-90 Remove the ASY-CVR-FE-FEED-SP (document feeder jam-access cover) (2 of 2)



ASY-TRY-SP (tray assembly)

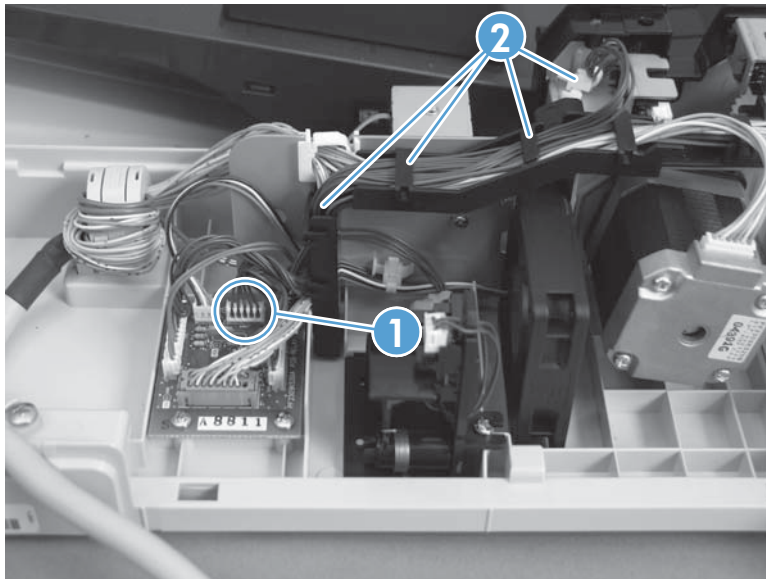
Before proceeding, remove the following components

- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).

Remove the ASY-TRY-SP (tray assembly)

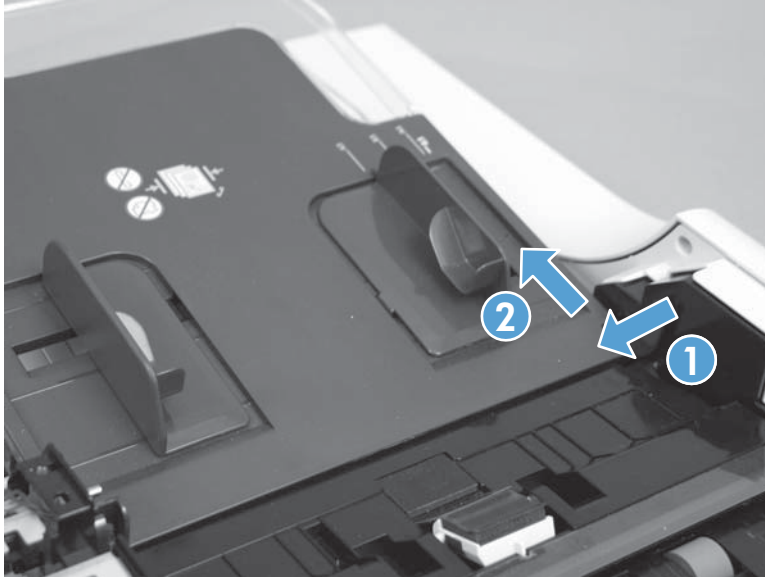
1. Open the jam-access cover.
2. Disconnect one connector (callout 1) and release the cable from the cable guides (callout 2).

Figure 2-91 Remove the ASY-TRY-SP (tray assembly) (1 of 2)



3. Release the pin from the hinge (callout 1) and then remove the tray assembly (callout 2).

Figure 2-92 Remove the ASY-TRY-SP (tray assembly) (2 of 2)



ASY-FRM-RE-FEED-SP (internal assembly)

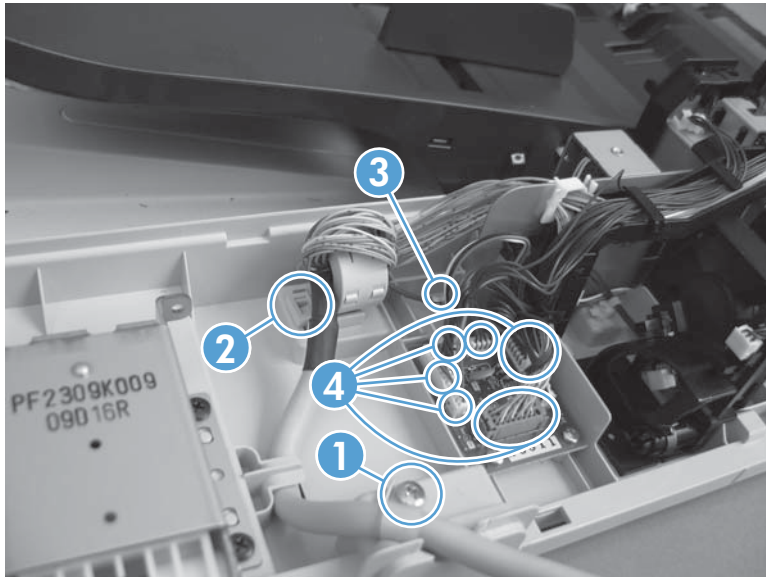
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- ASY-CVR-F-SP (document feeder front cover). See [ASY-CVR-F-SP \(document feeder front cover\) on page 129](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- Document feeder. See [Document feeder on page 151](#).
- ASY-CVR-FE-FEED-SP (document feeder jam-access cover). See [ASY-CVR-FE-FEED-SP \(document feeder jam-access cover\) on page 153](#).

Remove ASY-FRM-RE-FEED-SP (internal assembly)

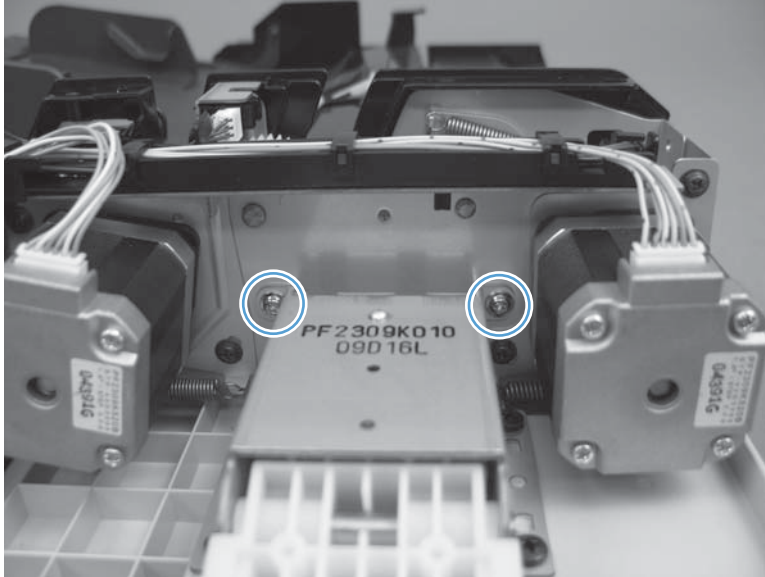
1. Remove one screw (callout 1), release one clamp (callout 2), and then disconnect six connectors (callout 3).

Figure 2-93 Remove the ASY-FRM-RE-FEED-SP (internal assembly) (1 of 3)



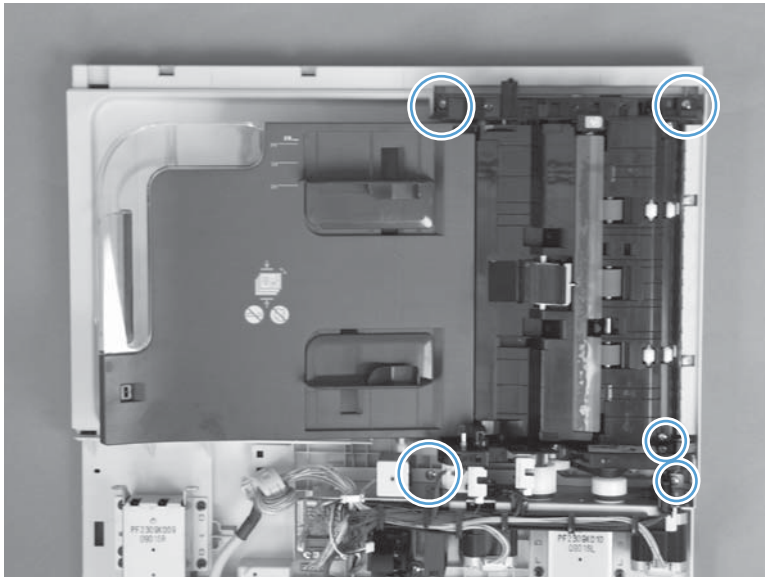
2. Remove two screws.

Figure 2-94 Remove the ASY-FRM-RE-FEED-SP (internal assembly) (2 of 3)



3. Remove five screws, and then remove the assembly.

Figure 2-95 Remove the ASY-FRM-RE-FEED-SP (internal assembly) (3 of 3)



ASY-PBA-RELAY-SB (document feeder PCA)

Before proceeding, remove the following components

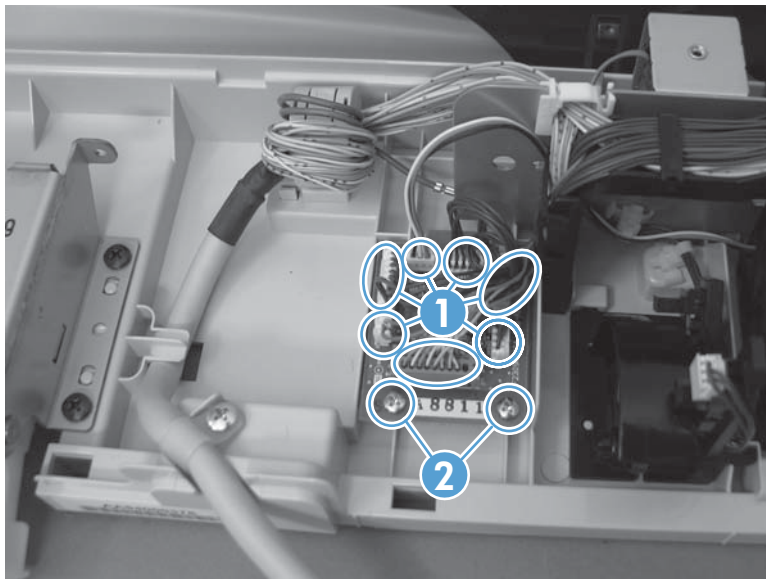
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- Document feeder. See [Document feeder on page 151](#).

Remove the ASY-PBA-RELAY-SB (document feeder PCA)

CAUTION:  ESD-sensitive part.

- ▲ Disconnect seven connectors (callout 1), remove two screws (callout 2), and then remove the PCA.

Figure 2-96 Remove the ASY-PBA-RELAY-SB (document feeder PCA)



ASM-IF-SP (document feeder cable)

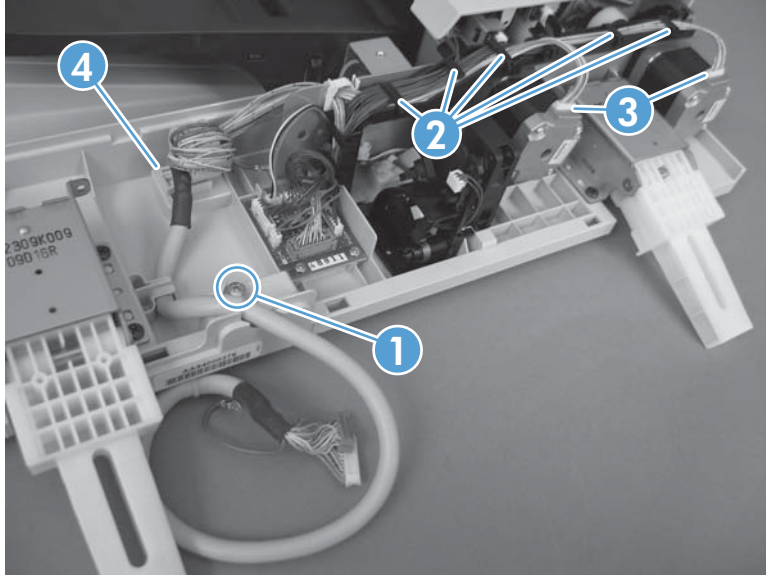
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover) [S-CVR-REAR \(scanner rear cover\) on page 128](#)
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- Document feeder. See [Document feeder on page 151](#).

Remove the ASM-IF-SP (document feeder cable)

- ▲ Remove one screw (callout 1), release the cable guides (callout 2), disconnect two connectors (callout 3), release one tab (callout 4). Remove the document feeder cable.

Figure 2-97 Remove the ASM-IF-SP (document feeder cable) (1 of 2)



NOTE: When reinstalling the cable, make sure to correctly wrap the cable in the toroid.

Figure 2-98 Remove the ASM-IF-SP (document feeder cable) (2 of 2)



ASY-HNG-L-SP (document feeder left hinge)

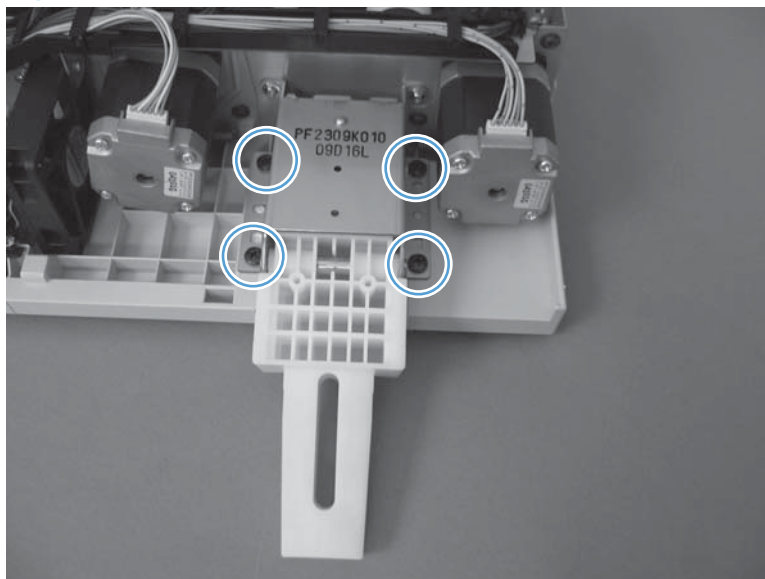
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- Document feeder. See [Document feeder on page 151](#).

Remove the ASY-HNG-L-SP (document feeder left hinge)

- ▲ Remove four screws and then remove the hinge.

Figure 2-99 Remove the ASY-HNG-L-SP (document feeder left hinge)



ASY-HNG-R-SP (document feeder right hinge)

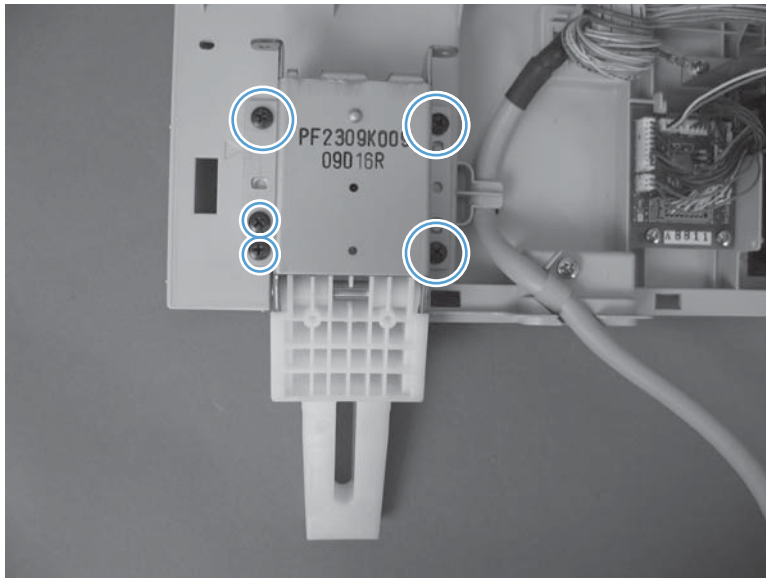
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- Document feeder. See [Document feeder on page 151](#).

Remove the ASY-HNG-R-SP (document feeder right hinge)

- ▲ Remove five screws and then remove the hinge.

Figure 2-100 Remove the ASY-HNG-L-SP (document feeder right hinge)



ASY-FAN-SP (document feeder fan)

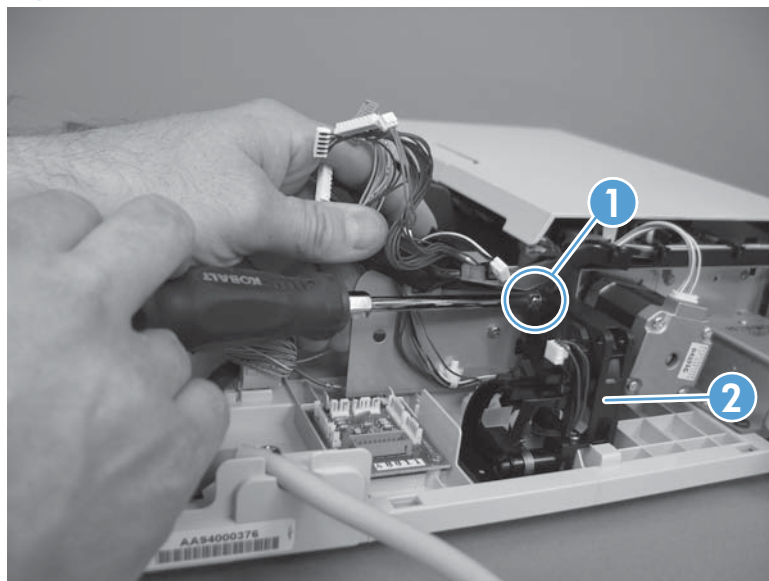
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- Document feeder. See [Document feeder on page 151](#).

Remove the ASY-FAN-SP (document feeder fan)

- ▲ Disconnect all connectors from the document feeder PCA and lift the cable guide to provide access to the screw (callout 1). Remove one screw (callout 1), and then remove the document feeder fan (callout 2).

Figure 2-101 Remove the ASY-FAN-SP (document feeder fan)



ASY-MOT-FE-SP (motor)

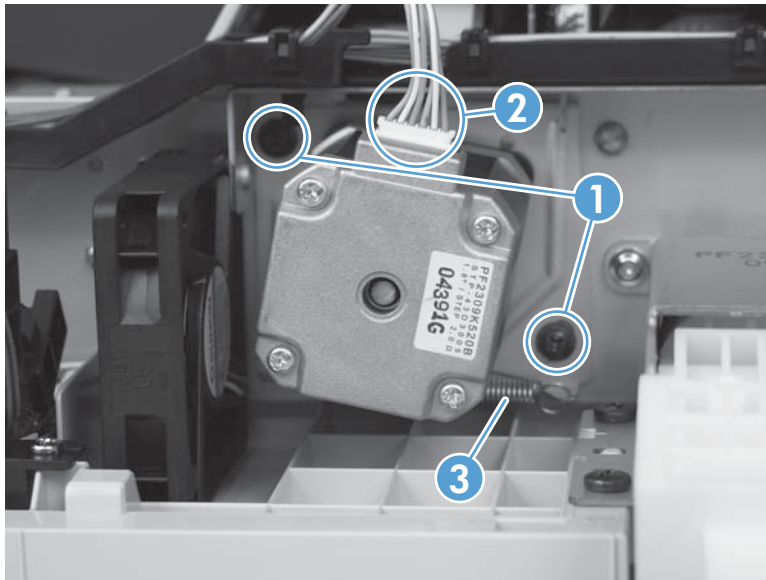
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- Document feeder. See [Document feeder on page 151](#).

Remove the ASY-MOT-FE-SP (motor)

- ▲ Remove two screws (callout 1), disconnect one connector (callout 2), release one spring (callout 3), and then remove the motor.

Figure 2-102 Remove the ASY-MOT-FE-SP (motor)



NOTE: When reassembling, reattach the spring before reinstalling screws.

ASY-MOT-RE-SP (document feeder motor)

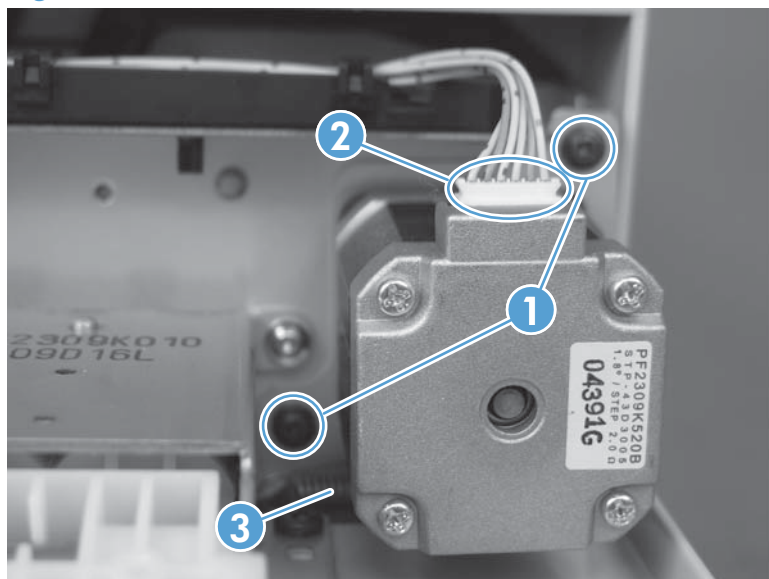
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- Document feeder. See [Document feeder on page 151](#).

Remove the ASY-MOT-RE-SP (motor)

- ▲ Remove two screws (callout 1), disconnect one connector (callout 2), release one spring (callout 3), and then remove the motor.

Figure 2-103 Remove the ASY-MOT-RE-SP (motor)



 **NOTE:** When reassembling, reattach the spring before reinstalling screws.

ASY-DFSENS-SP (document feeder open sensor)

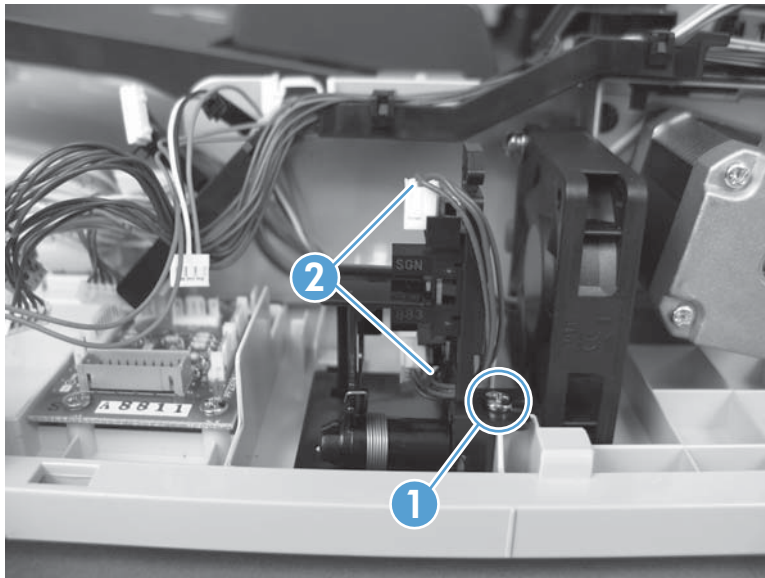
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- Document feeder. See [Document feeder on page 151](#).

Remove the ASY-DFSENS-SP (document feeder open sensor)

- ▲ Remove one screw (callout 1), disconnect two connectors (callout 2), and then remove the sensor.

Figure 2-104 Remove the ASY-DFSENS-SP (document feeder open sensor)



ASY-GIDREV-SPR-SP (document feeder jam access plate)

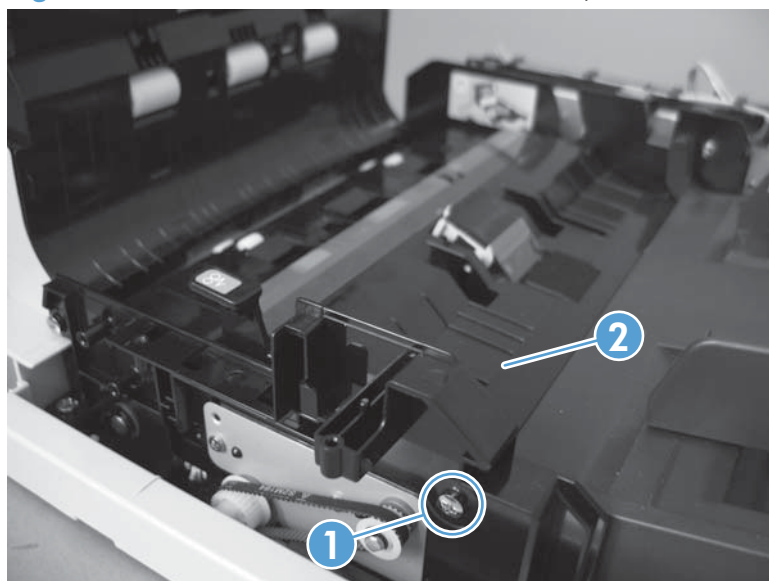
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- Document feeder. See [Document feeder on page 151](#).

Remove the ASY-GIDREV-SPR-SP (document feeder jam access plate)

- ▲ Remove one stepped screw (callout 1) and then remove the jam access plate (callout 2).

Figure 2-105 Remove the ASY-GIDREV-SPR-SP (document feeder jam access plate)



ASY-BASE_SB (base assembly)

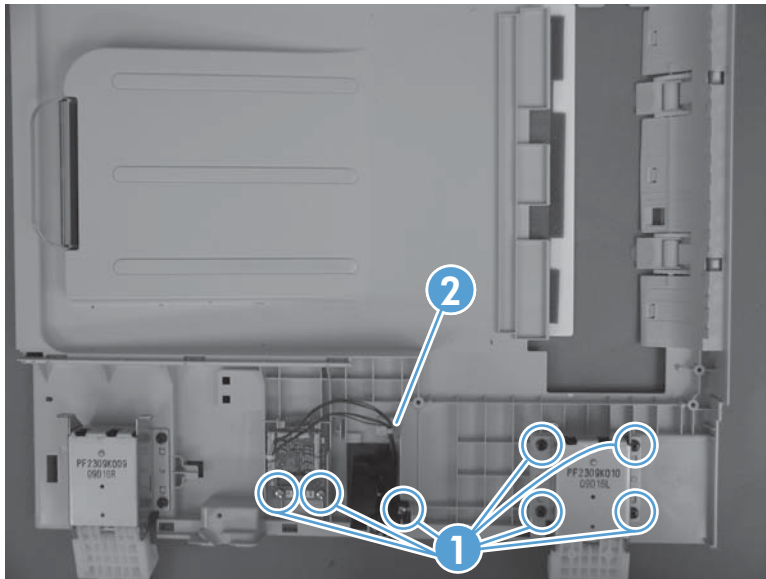
Before proceeding, remove the following components

- ASY-CVR-F-SP (document feeder front cover). See [ASY-CVR-F-SP \(document feeder front cover\) on page 129](#).
- ASY-CVR-F-R-SP (document feeder rear cover). See [ASY-CVR-F-R-SP \(document feeder rear cover\) on page 131](#).
- ASY-CVR-FE-FEED-SP (document feeder jam-access cover). See [ASY-CVR-FE-FEED-SP \(document feeder jam-access cover\) on page 153](#).
- ASY-FAN-SP (document feeder fan). See [ASY-FAN-SP \(document feeder fan\) on page 164](#).
- ASY-FRM-RE-FEED-SP (internal assembly). See [ASY-FRM-RE-FEED-SP \(internal assembly\) on page 157](#).

Remove the ASY-BASE_SB (base assembly)

- ▲ Remove seven screws (callout 1) and then release one cable clamp (callout 2). Remove the right hinge, document feeder PCA, and document feeder open sensor from the base assembly.

Figure 2-106 Remove the ASY-BASE_SB (base assembly)



Scanner

Scanner filter cover and scanner filter

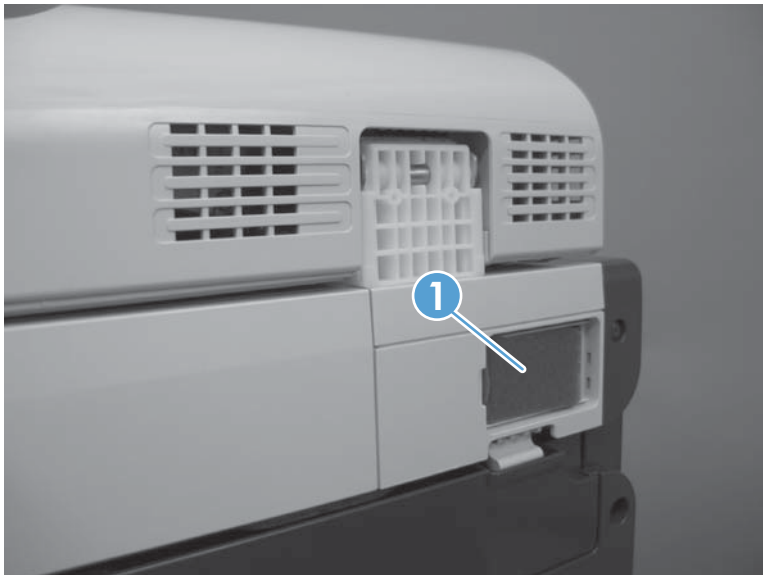
1. Remove the scanner-filter cover (callout 1).

Figure 2-107 Remove the scanner filter (1 of 2)



2. Remove the filter (callout 1).

Figure 2-108 Remove the scanner filter (2 of 2)



Scanner assembly

Before proceeding, remove the following components

- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Document feeder. See [Document feeder on page 151](#).

Remove the scanner

1. Carefully open the scanner.

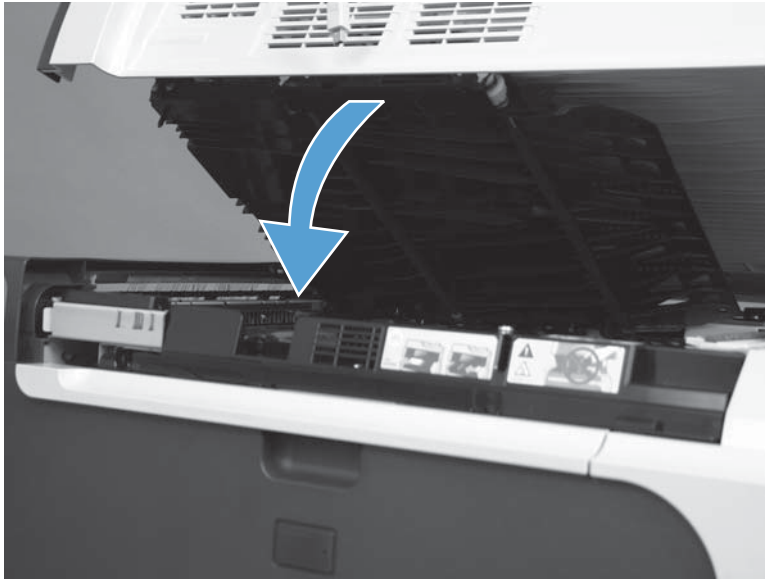
⚠ WARNING! When the document feeder is removed from the product, the scanner opens with force. Press down on the scanner with one hand when releasing the scanner latch.

Figure 2-109 Remove the scanner assembly (1 of 6)



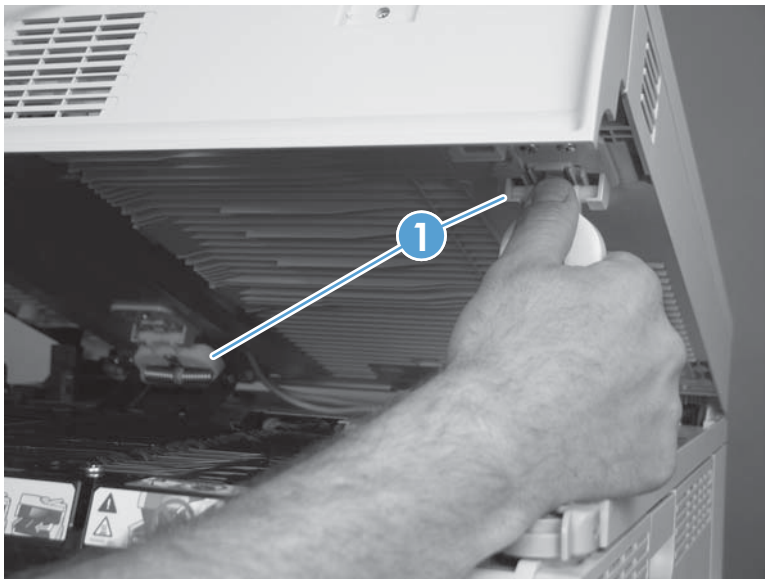
2. Lower the jam access cover.

Figure 2-110 Remove the scanner assembly (2 of 6)



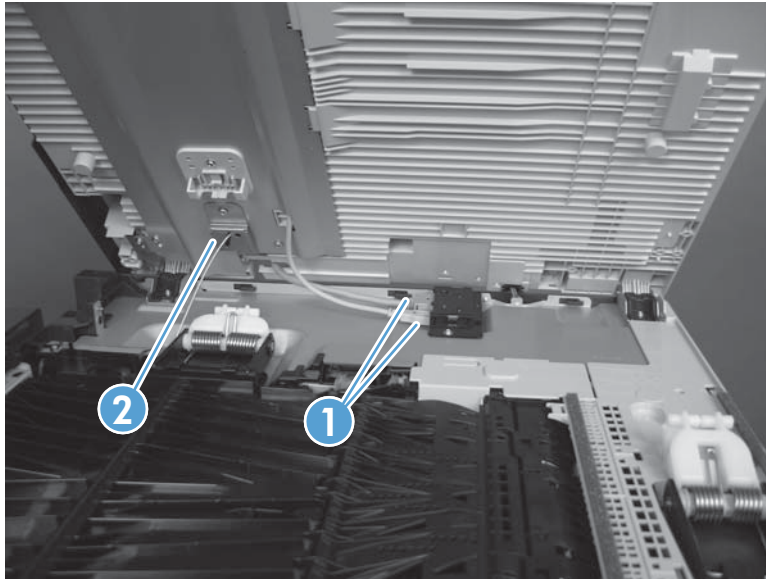
3. Release two scissor hinges (callout 1).

Figure 2-111 Remove the scanner assembly (3 of 6)



4. Disconnect two connectors (callout 1) and release the safety cable (callout 2).

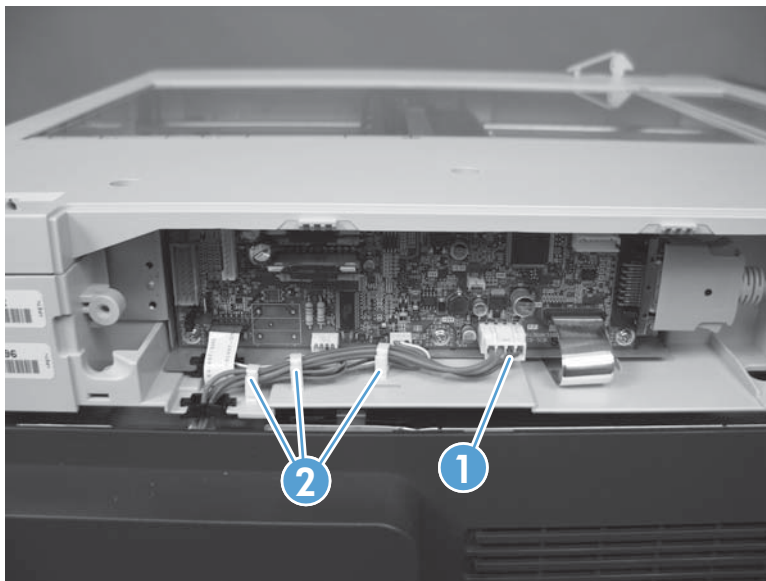
Figure 2-112 Remove the scanner assembly (4 of 6)



⚠ WARNING! The scanner is no longer secured to the product. To prevent the scanner from falling from the product, firmly grasp the scanner when opening.

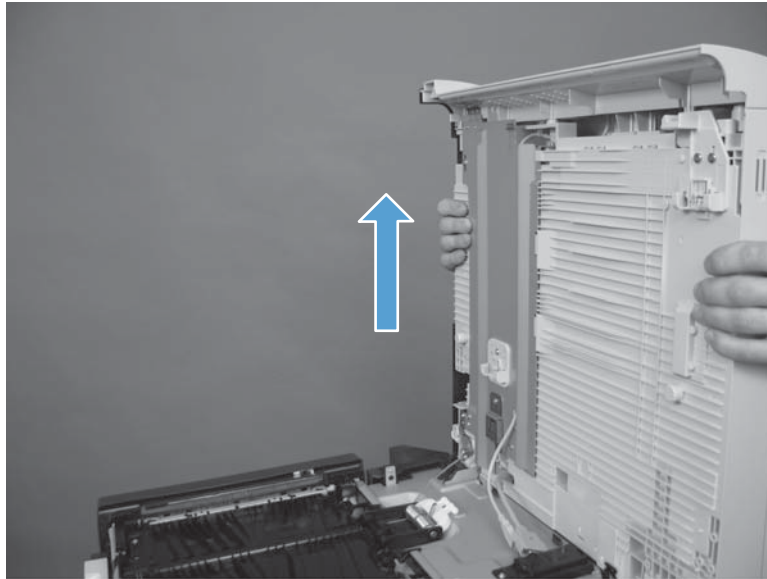
5. Disconnect one connector (callout 1), and then release the cable from the cable guides (callout 2).

Figure 2-113 Remove the scanner assembly (5 of 6)



6. From the rear of the product, lift the scanner to remove.

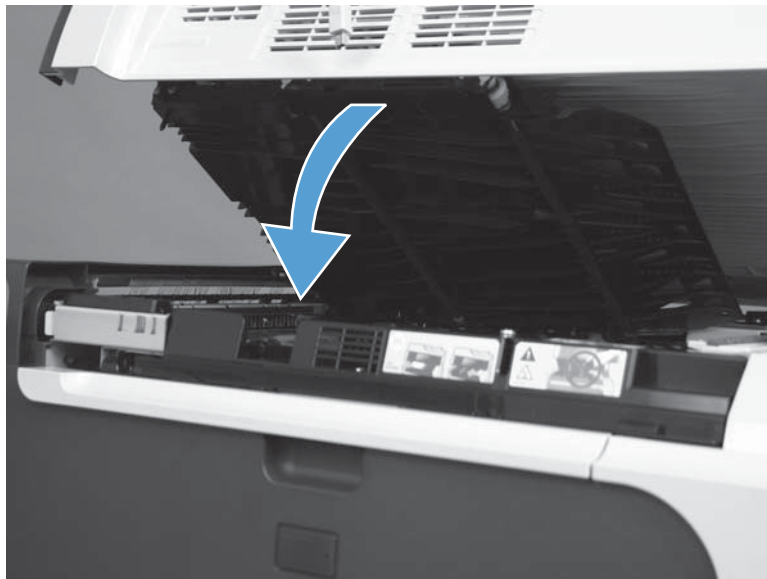
Figure 2-114 Remove the scanner assembly (6 of 6)



Scissor hinge assemblies

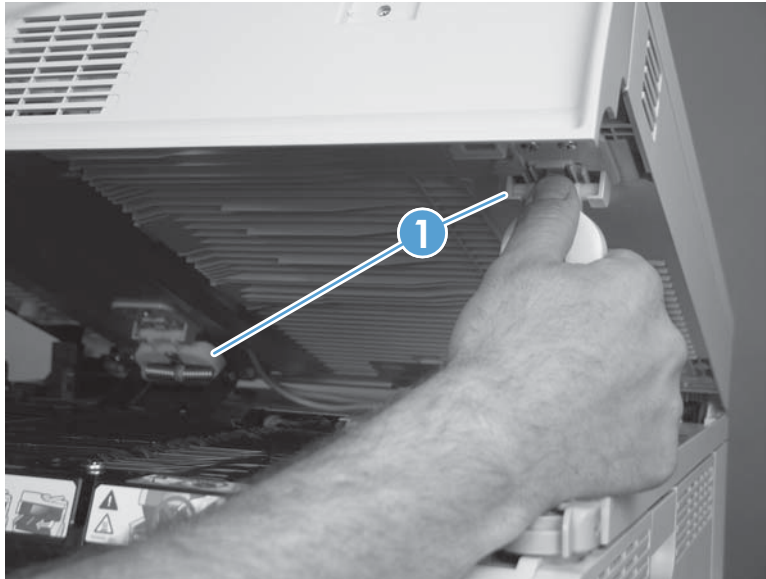
1. Open the scanner and then lower the jam access cover.

Figure 2-115 Remove the scissor hinge assembly (1 of 3)



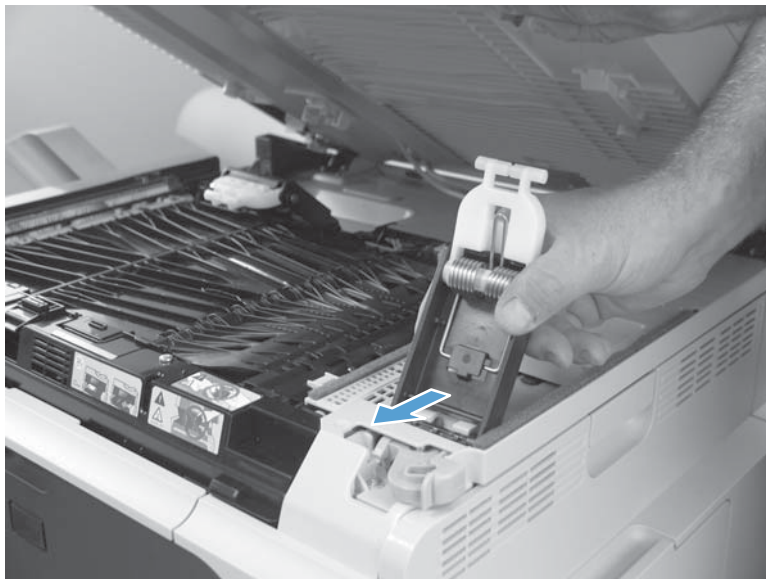
2. Release the top of the two scissor hinges (callout 1).

Figure 2-116 Remove the scissor hinge assembly (2 of 3)



3. Release the bottom of the two scissor hinges and remove.

Figure 2-117 Remove the scissor hinge assembly (3 of 3)



S-ASSY-CP-ADAPTER (CP adapter assembly)

Before proceeding, remove the following components

- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).

Remove the S-ASSY-CP-ADAPTER (CP adapter assembly)

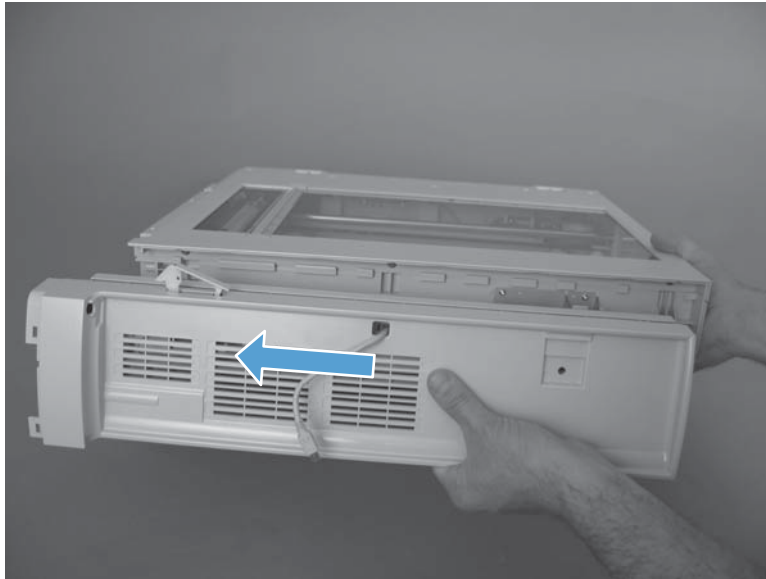
1. Remove two screws.

Figure 2-118 Remove the S-ASSY-CP-ADAPTER (CP adapter assembly) (1 of 4)



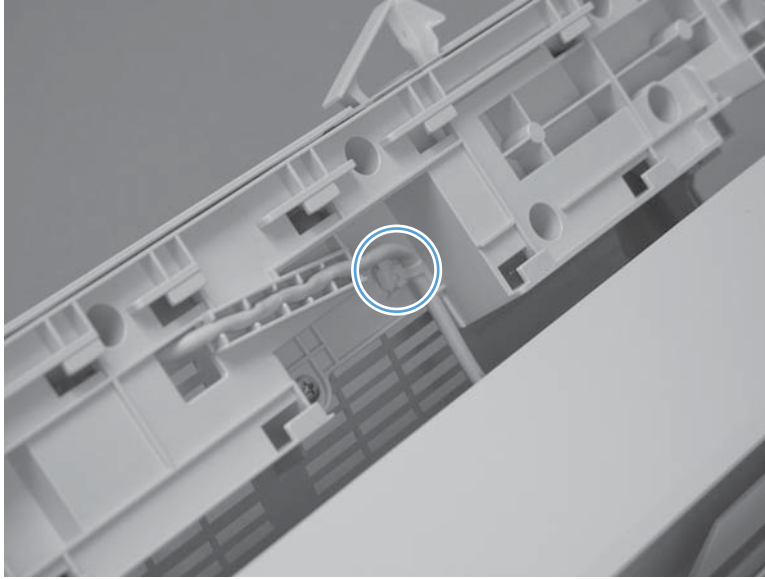
2. Slide the CP adapter assembly to the left to release.

Figure 2-119 Remove the S-ASSY-CP-ADAPTER (CP adapter assembly) (2 of 4)



3. Squeeze the retainer to release the cable from the back of the CP adapter assembly.

Figure 2-120 Remove the S-ASSY-CP-ADAPTER (CP adapter assembly) (3 of 4)



CAUTION: After removing the CP adapter assembly from the scanner, be careful not to damage the ground spring.

Figure 2-121 Remove the S-ASSY-CP-ADAPTER (CP adapter assembly) (4 of 4)



S-PBA-SCB (SCB)

Before proceeding, remove the following components

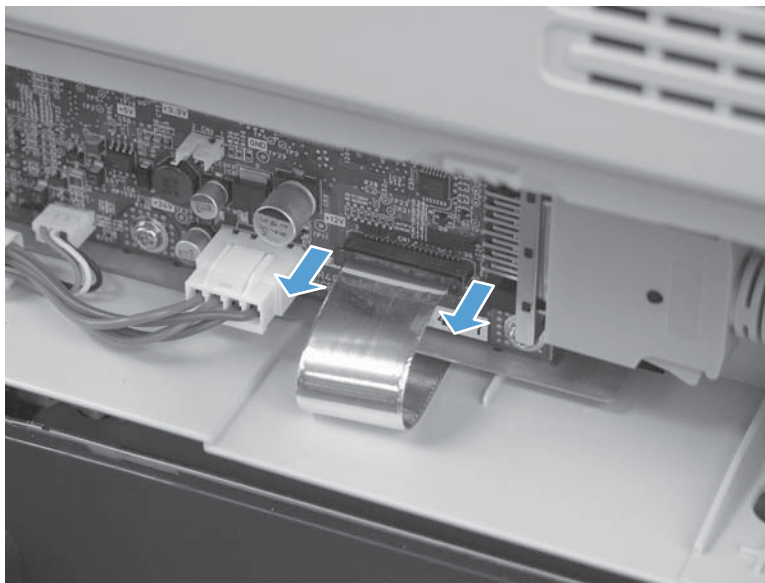
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\)](#) on page 128.

Remove the S-PBA-SCB (SCB)

⚠ CAUTION:  ESD-sensitive part.

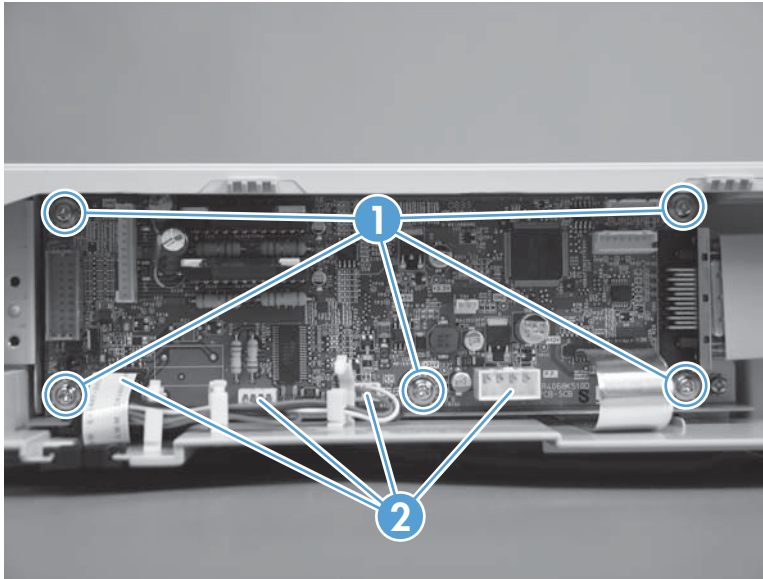
1. Carefully unlatch the top of the zero insertion force (ZIF) connector to release the flat flexible cable (FFC). Disconnect the FFC.

Figure 2-122 Remove the S-PBA-SCB (SCB) (1 of 2)



2. Remove five screws (callout 1), disconnect four connectors (callout 2), and then remove the SCB.

Figure 2-123 Remove the S-PBA-SCB (SCB) (2 of 2)



S-ASM-USB (USB control panel cable)

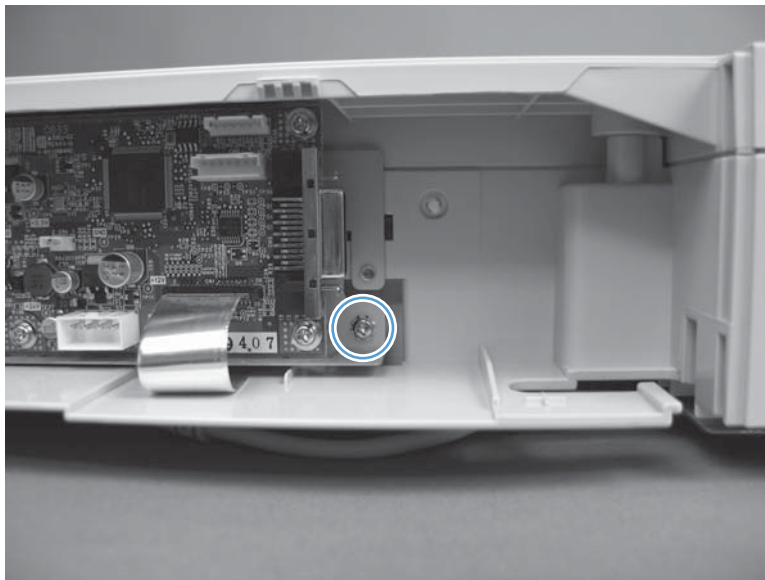
Before proceeding, remove the following components

- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- S-ASSY-CP-ADAPTER (CP adapter assembly). See [S-ASSY-CP-ADAPTER \(CP adapter assembly\) on page 176](#)

Remove the S-ASM-USB (USB control panel cable)

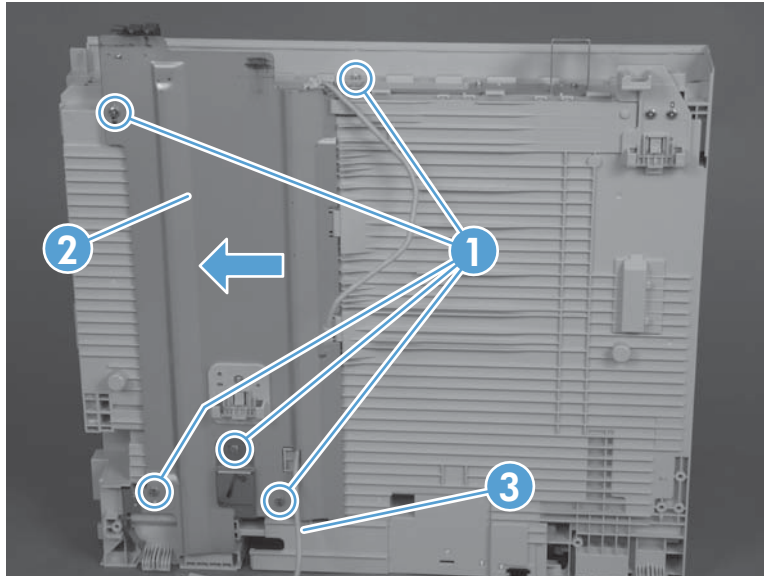
1. Remove one screw.

Figure 2-124 Remove the S-ASM-USB (USB control panel cable) (1 of 2)



2. Remove five screws (callout 1), and then slide the lift plate (callout 2) and remove. Remove the cable (callout 3).

Figure 2-125 Remove the S-ASM-USB (USB control panel cable) (2 of 2)



S-HNG-LIFT-R (scanner release assembly)

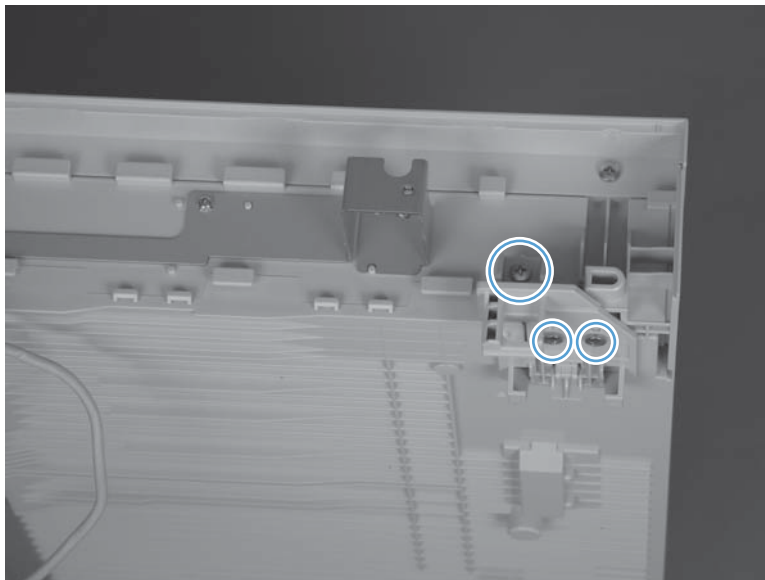
Before proceeding, remove the following components

- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- S-ASSY-CP-ADAPTER (CP adapter assembly). See [S-ASSY-CP-ADAPTER \(CP adapter assembly\) on page 176](#).

Remove the S-HNG-LIFT-R (scanner release assembly)

- ▲ Remove three screws, and then remove the scanner release assembly.

Figure 2-126 Remove the S-HNG-LIFT-R (scanner release assembly)



S-ASSY-UPPER-UNIT (tub top)

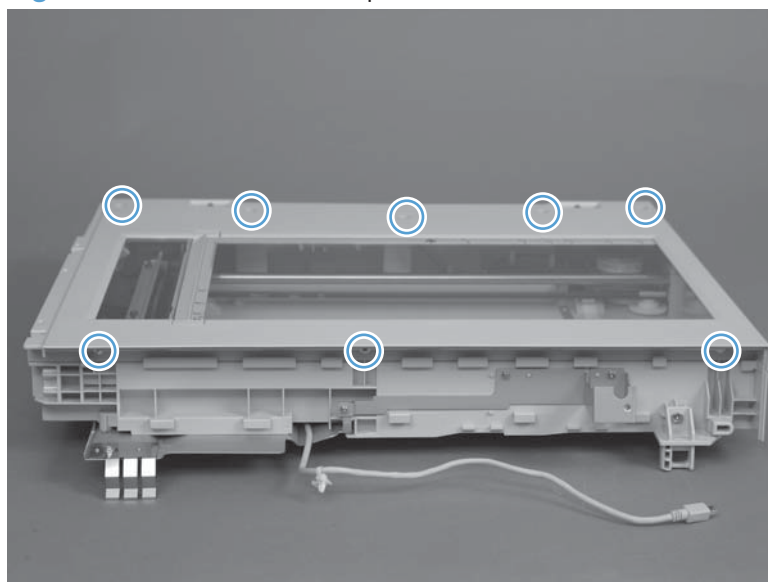
Before proceeding, remove the following components

- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- S-ASSY-CP-ADAPTER (CP adapter assembly). See [S-ASSY-CP-ADAPTER \(CP adapter assembly\) on page 176](#).

Remove the S-ASSY-UPPER-UNIT (tub top)

- ▲ Remove eight screws and then remove the tub top.

Figure 2-127 Remove tub top



S-PBA-TYUKEI (interconnect board) and S-SNS-EY3A1061-2 (size sensor)

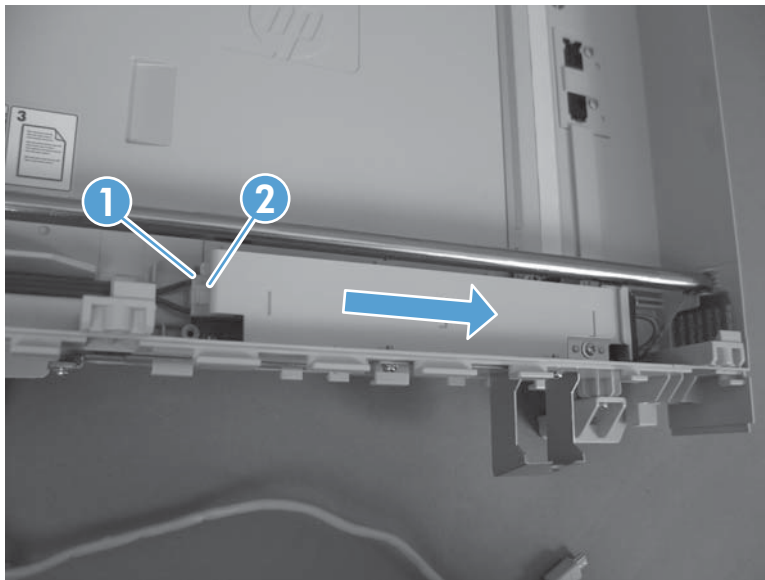
Before proceeding, remove the following components

- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- S-ASSY-CP-ADAPTER (CP adapter assembly). See [S-ASSY-CP-ADAPTER \(CP adapter assembly\) on page 176](#).
- S-ASSY-UPPER-UNIT. See [S-ASSY-UPPER-UNIT \(tub top\) on page 184](#).

Remove the S-PBA-TYUKEI (interconnect board) and S-SNS-EY3A1061-2 (size sensor)

1. Disconnect one connector (callout 1), release one tab (callout 2), and then slide the inverter cover to the right to remove.

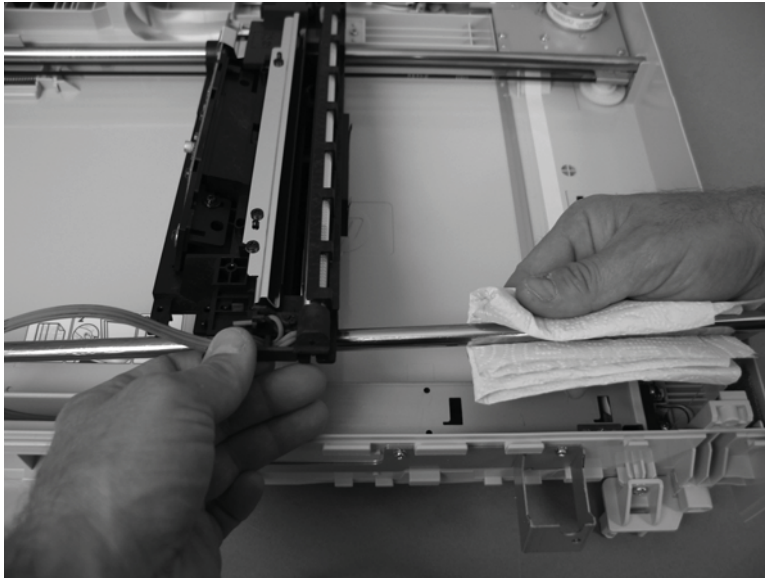
Figure 2-128 Remove the S-PBA-TYUKEI (interconnect board) and S-SNS-EY3A1061-2 (size sensor) (1 of 4)



2. Move the carriage to the center of the scanner.

3. Remove the front side shaft.

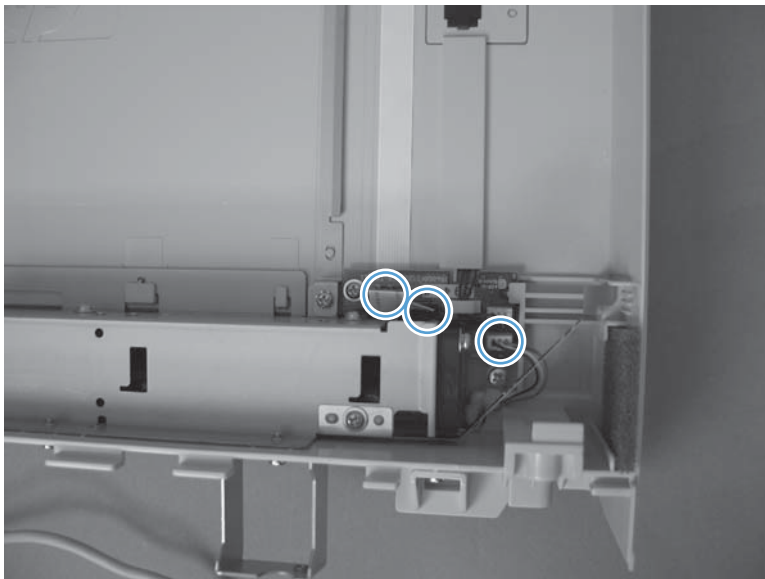
Figure 2-129 Remove the S-PBA-TYUKEI (interconnect board) and S-SNS-EY3A1061-2 (size sensor) (2 of 4)



CAUTION: Grease is applied to the shaft. Avoid removing the grease from the shaft. Keep the grease away from other parts of the product.

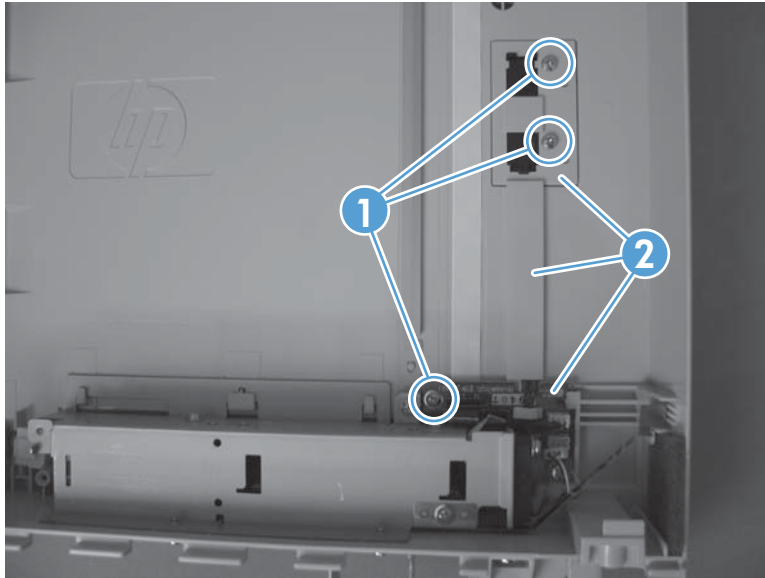
4. Disconnect two FFCs and one connector.

Figure 2-130 Remove the S-PBA-TYUKEI (interconnect board) and S-SNS-EY3A1061-2 (size sensor) (3 of 4)



5. Remove three screws (callout 1) and the interconnect board and size sensor (callout 2).

Figure 2-131 Remove the S-PBA-TYUKEI (interconnect board) and S-SNS-EY3A1061-2 (size sensor) (4 of 4)



S-ASSY-INV (inverter)

- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- S-ASSY-CP-ADAPTER (CP adapter assembly). See [S-ASSY-CP-ADAPTER \(CP adapter assembly\) on page 176](#).
- S-ASSY-UPPER-UNIT (tub top). See [S-ASSY-UPPER-UNIT \(tub top\) on page 184](#).
- S-PBA-TYUKEI (interconnect board) and S-SNS-EY3A1061-2 (size sensor). See [S-PBA-TYUKEI \(interconnect board\) and S-SNS-EY3A1061-2 \(size sensor\) on page 185](#).

Remove the S-ASSY-INV (inverter)

CAUTION:  ESD-sensitive part.

1. Remove six screws.


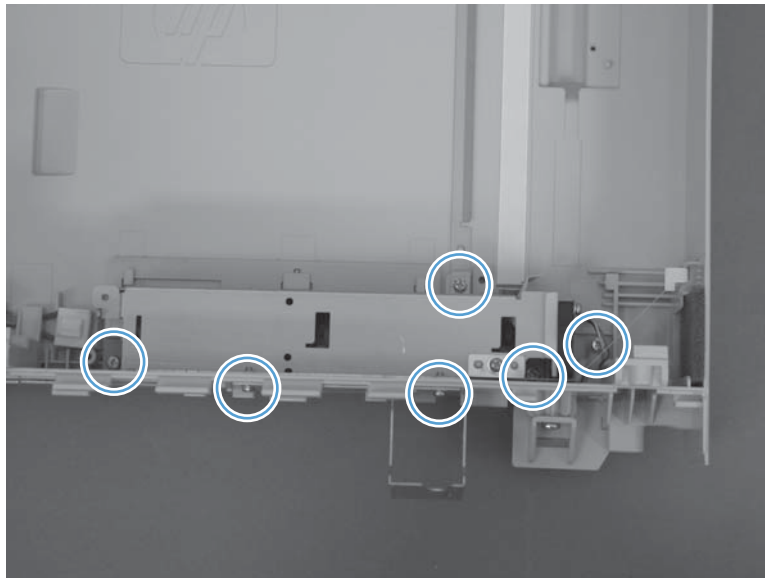
 **NOTE:** Make sure to note the locations of each screw type.

Figure 2-132 Remove the S-ASSY-INV (inverter) (1 of 2)



2. Carefully lift the grounding plate and then remove the inverter.

CAUTION: Do not deform the grounding plate. Deforming the grounding plate can cause the optical carriage to malfunction.

Figure 2-133 Remove the S-ASSY-INV (inverter) (2 of 2)



S-FAN-MFB-30E-05A-006 (inverter fan)

Before proceeding, remove the following components

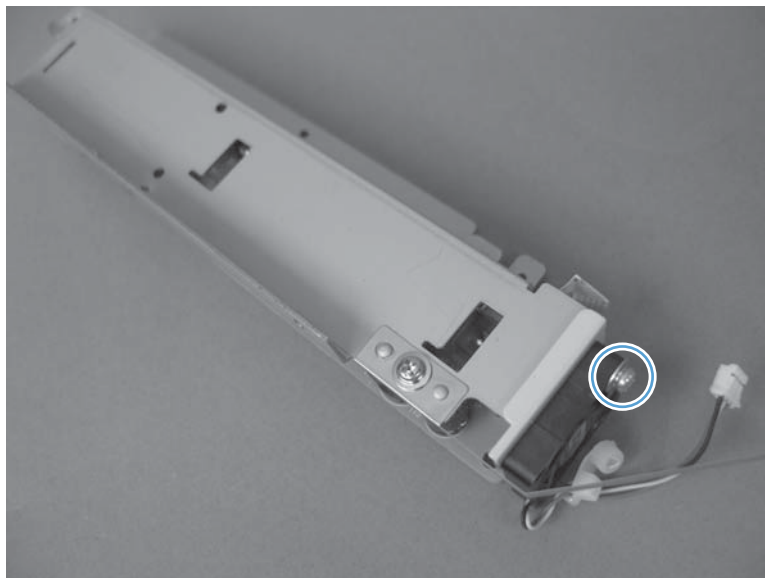
- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- S-ASSY-CP-ADAPTER (CP adapter assembly). See [S-ASSY-CP-ADAPTER \(CP adapter assembly\) on page 176](#).
- S-ASSY-UPPER-UNIT (tub top). See [S-ASSY-UPPER-UNIT \(tub top\) on page 184](#).
- S-PBA-TYUKEI (interconnect board) and S-SNS-EY3A1061-2 (size sensor). See [S-PBA-TYUKEI \(interconnect board\) and S-SNS-EY3A1061-2 \(size sensor\) on page 185](#).
- S-ASSY-INV (inverter). See [S-ASSY-INV \(inverter\) on page 188](#).

Remove the S-FAN-MFB-30E-05A-006 (inverter fan)

- ▲ Remove one screw, and then remove the inverter fan.

CAUTION: Check the arrows embossed on the fan frame that indicate air flow direction. When the fan is reinstalled, the air must flow in the correct direction.

Figure 2-134 Remove the S-FAN-MFB-30E-05A-006 (inverter fan)



ASSY-CRG-UNIT-IR4068 (optical assembly)

- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- S-ASSY-CP-ADAPTER (CP adapter assembly). See [S-ASSY-CP-ADAPTER \(CP adapter assembly\) on page 176](#).
- S-PBA-SCB (SCB). See [S-PBA-SCB \(SCB\) on page 179](#).
- S-ASSY-UPPER-UNIT (tub top). See [S-ASSY-UPPER-UNIT \(tub top\) on page 184](#).

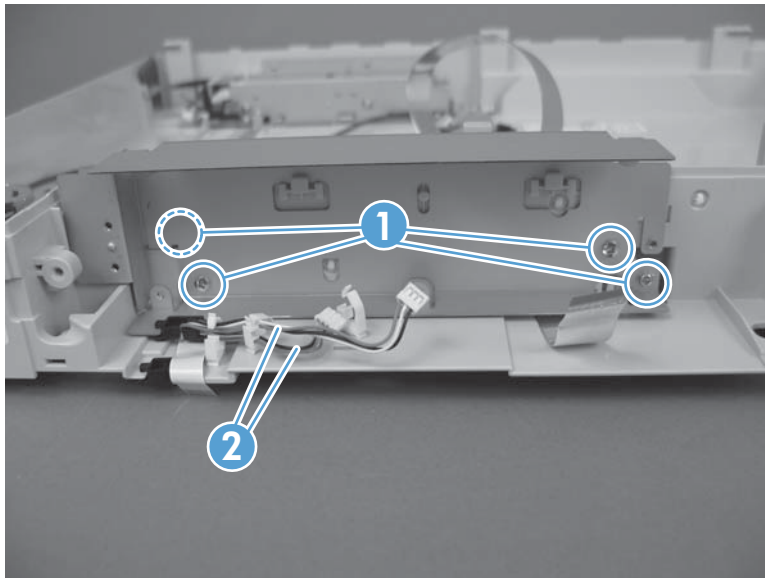
Remove the ASSY-CRG-UNIT-IR4068 (optical assembly)

⚠ CAUTION: If removing both shafts, be sure to return each shaft in its original position. The front shaft has oil applied and rear shaft has grease applied.

CAUTION: Avoid removing the grease and oil from the shafts. Keep the grease and oil away from other parts of the product.

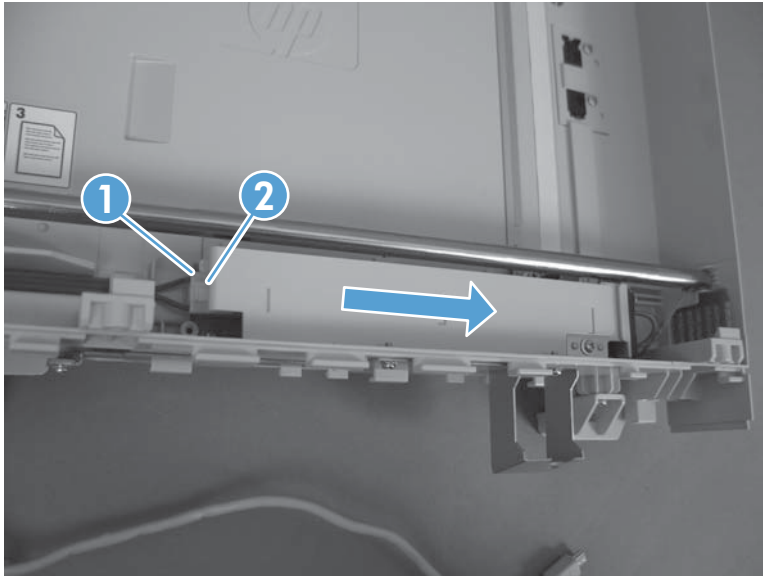
1. Remove four screws (callout 1), release two cables (callout 2) from the cable guides, and then remove the sheet metal box.

Figure 2-135 Remove the ASSY-CRG-UNIT-IR4068 (optical assembly) (1 of 6)



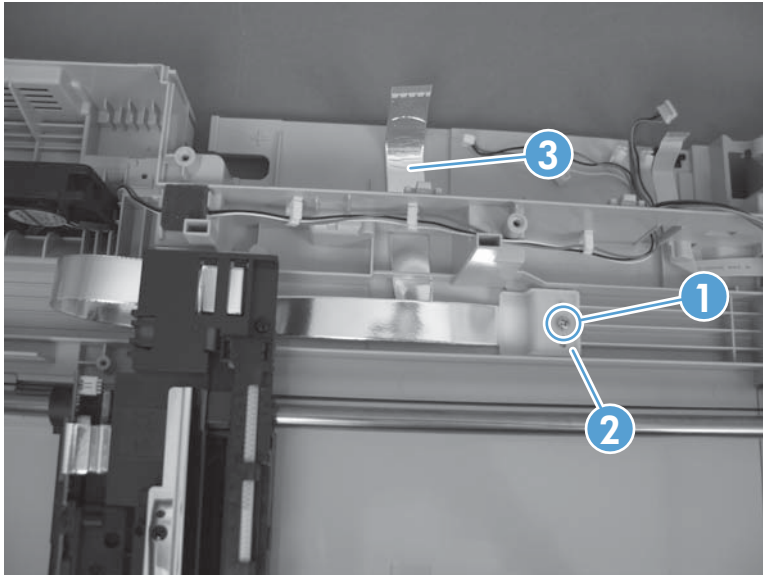
2. Disconnect one connector (callout 1), release one tab (callout 2), and then slide the inverter cover to the right to remove.

Figure 2-136 Remove the ASSY-CRG-UNIT-IR4068 (optical assembly) (2 of 6)



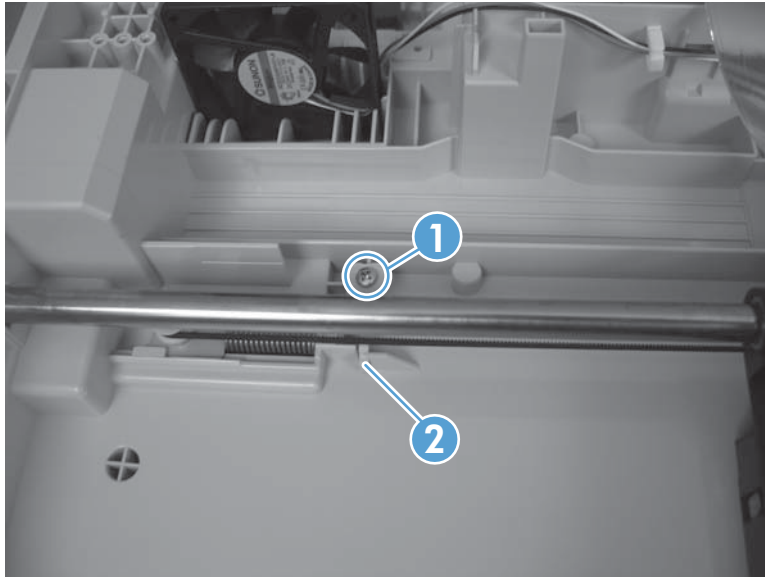
3. Move the carriage to the center of the scanner.
4. Remove one screw (callout 1) and restraint (callout 2). Release the FFC (callout 3) from the tape.

Figure 2-137 Remove the ASSY-CRG-UNIT-IR4068 (optical assembly) (3 of 6)



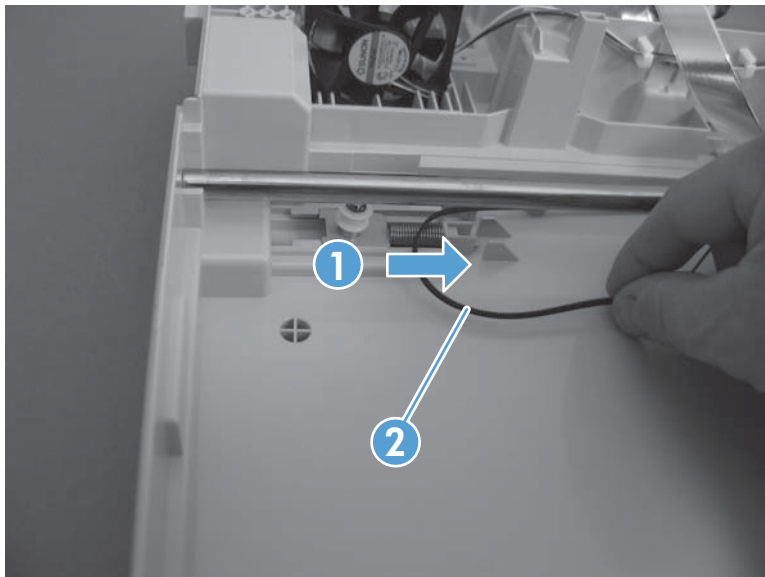
5. Remove one screw (callout 1), and then remove the stop (callout 2).

Figure 2-138 Remove the ASSY-CRG-UNIT-IR4068 (optical assembly) (4 of 6)



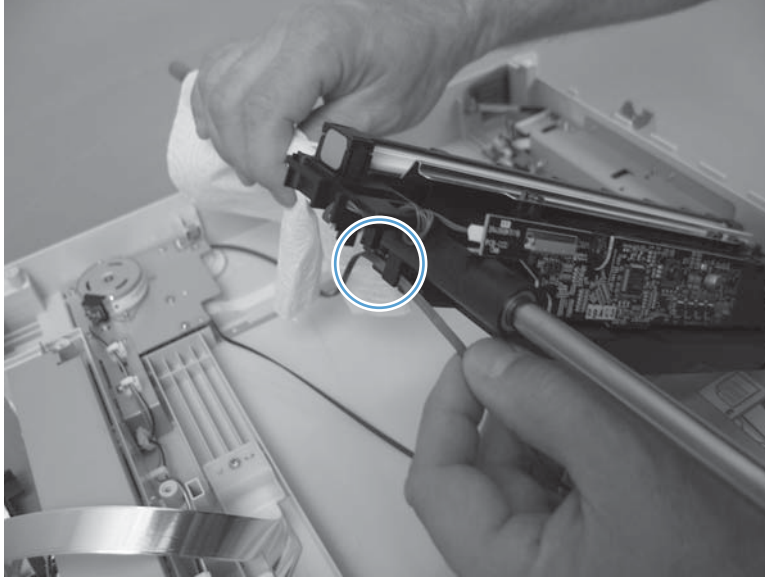
6. Compress the spring until it locks (callout 1), and then remove the belt (callout 2) from the pulley.

Figure 2-139 Remove the ASSY-CRG-UNIT-IR4068 (optical assembly) (5 of 6)



7. Release the belt from the optical assembly and then remove the assembly.

Figure 2-140 Remove the ASSY-CRG-UNIT-IR4068 (optical assembly) (6 of 6)



CAUTION: Oil is applied to the shaft. Keep oil away from other parts of the product.

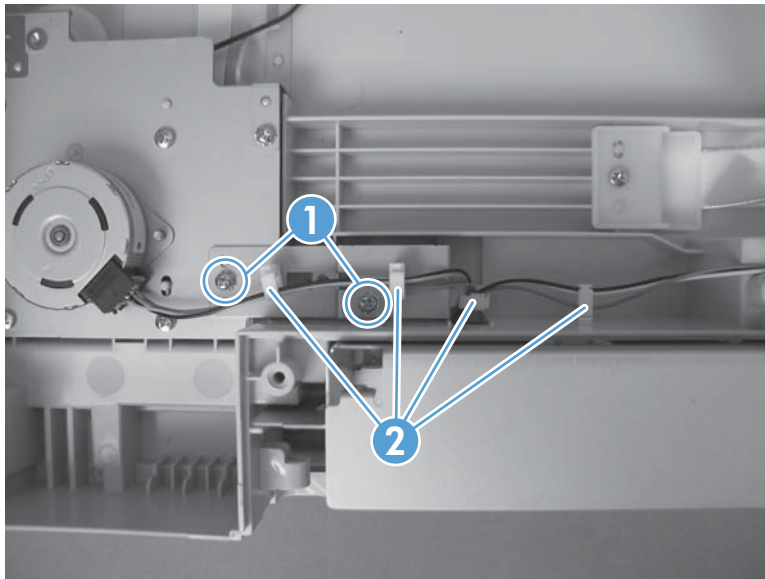
S-ASSY-MOTOR-UNIT (motor assembly)

- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- S-ASSY-CP-ADAPTER (CP adapter assembly). See [S-ASSY-CP-ADAPTER \(CP adapter assembly\) on page 176](#).
- S-PBA-SCB (SCB). See [S-PBA-SCB \(SCB\) on page 179](#).
- S-ASSY-UPPER-UNIT (tub top). See [S-ASSY-UPPER-UNIT \(tub top\) on page 184](#).
- ASSY-CRG-UNIT-IR4068 (optical assembly). See [ASSY-CRG-UNIT-IR4068 \(optical assembly\) on page 191](#).

Remove the S-ASSY-MOTOR-UNIT (motor assembly)

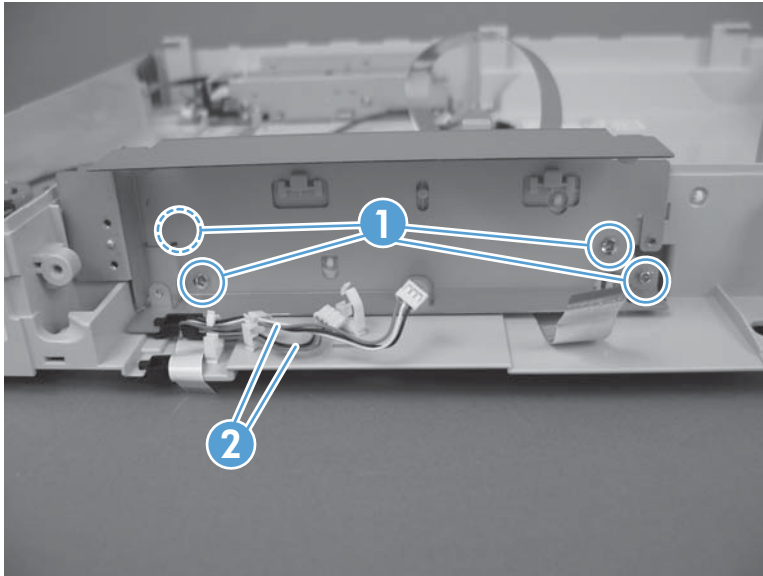
1. Remove two screws (callout 1) and then release the cables from the cable guides (callout 2).

Figure 2-141 Remove the S-ASSY-MOTOR-UNIT (motor assembly) (1 of 3)



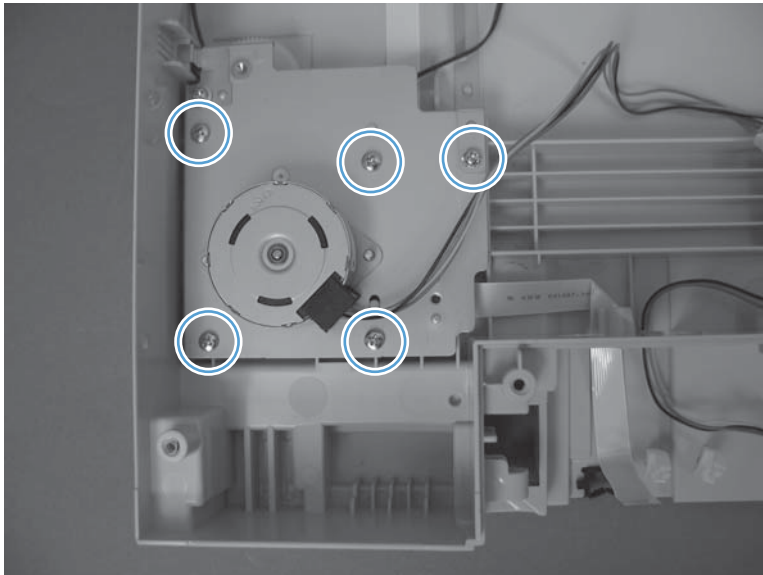
2. Remove three screws (callout 1), release two cables (callout 2) from the cable guides, and then remove the sheet metal box.

Figure 2-142 Remove the S-ASSY-MOTOR-UNIT (motor assembly) (2 of 3)



3. Remove five screws, and then remove the motor assembly.

Figure 2-143 Remove the S-ASSY-MOTOR-UNIT (motor assembly) (3 of 3)



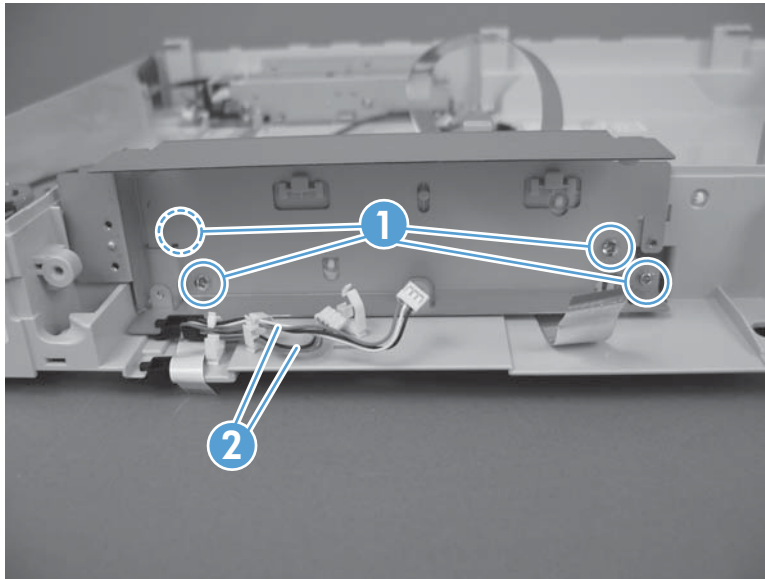
S-FAN-D06037600G-001 (scanner fan)

- Control panel. See [Control panel on page 100](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- S-ASSY-CP-ADAPTER (CP adapter assembly). See [S-ASSY-CP-ADAPTER \(CP adapter assembly\) on page 176](#).
- S-PBA-SCB (SCB). See [S-PBA-SCB \(SCB\) on page 179](#).
- S-ASSY-UPPER-UNIT (tub top). See [S-ASSY-UPPER-UNIT \(tub top\) on page 184](#).

Remove the S-FAN-D06037600G-001 (scanner fan)

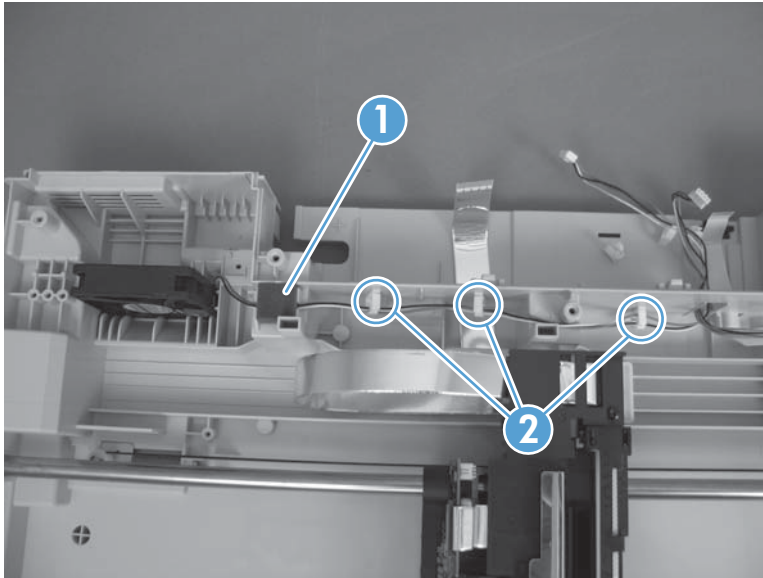
1. Remove four screws (callout 1), release two cables (callout 2) from the cable guides, and then remove the sheet metal box.

Figure 2-144 Remove the S-FAN-D06037600G-001 (scanner fan) (1 of 2)




2. Remove the foam (callout 1), release the cable from the cable guides (callout 2), and then remove the fan.

Figure 2-145 Remove the S-FAN-D06037600G-001 (scanner fan) (2 of 2)



⚠ CAUTION: When the fan is reinstalled, the air must flow into the product. Check the arrows embossed on the fan frame that indicate air flow direction.

Internal assemblies

 **TIP:** For clarity, some photos in this chapter show components removed that would not be removed to service the product. If necessary, remove the components listed at the beginning of a procedure before proceeding to service the product.

IPTU

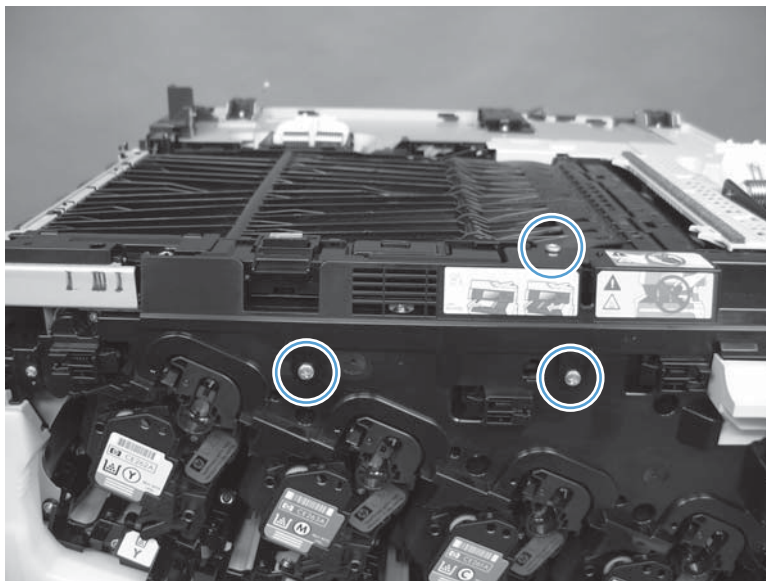
Before proceeding, remove the following components

- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).

Remove the IPTU

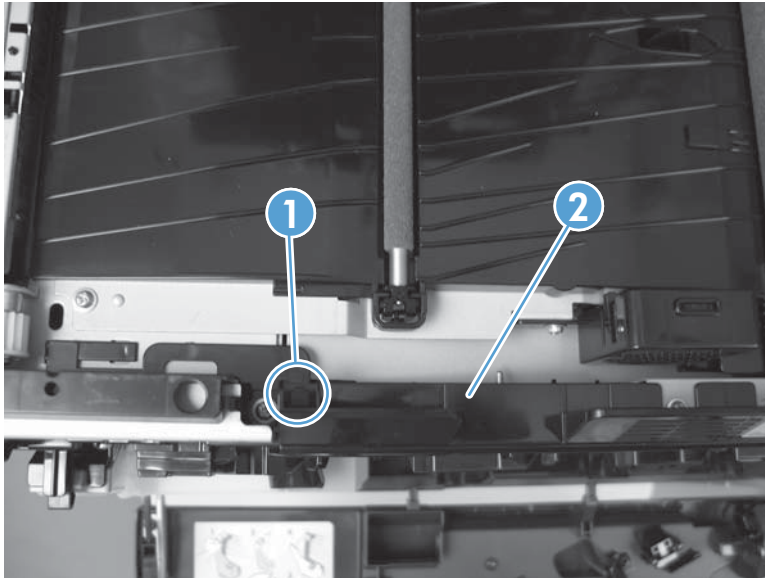
1. Open the front door and then remove three screws.

Figure 2-146 Remove the IPTU (1 of 5)



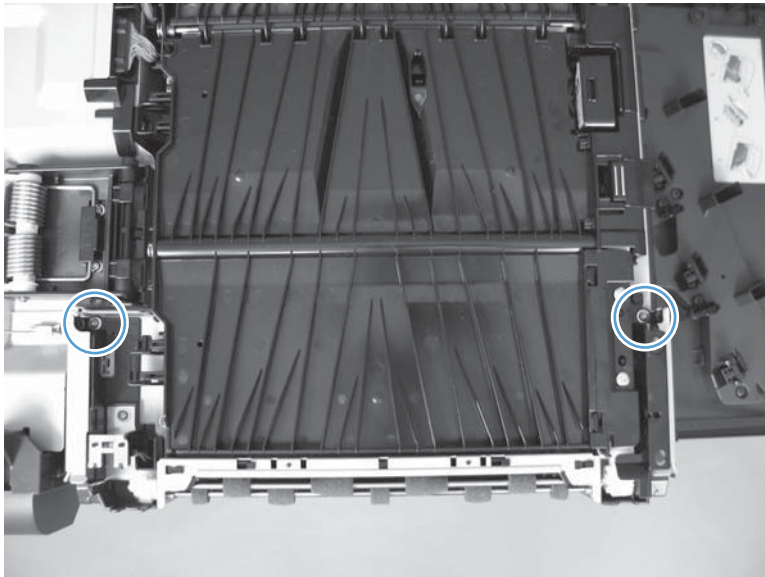
2. Lift the cover up on the right side to clear the pin, lift the paper path, rotate the cover on left side to release one tab (callout 1), and then remove the inner cover (callout 2).

Figure 2-147 Remove the IPTU (2 of 5)



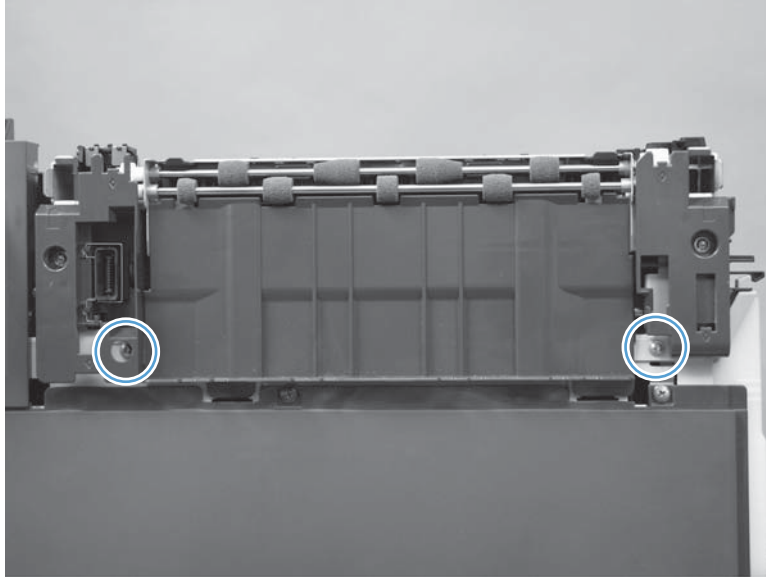
3. Remove two screws.

Figure 2-148 Remove the IPTU (3 of 5)



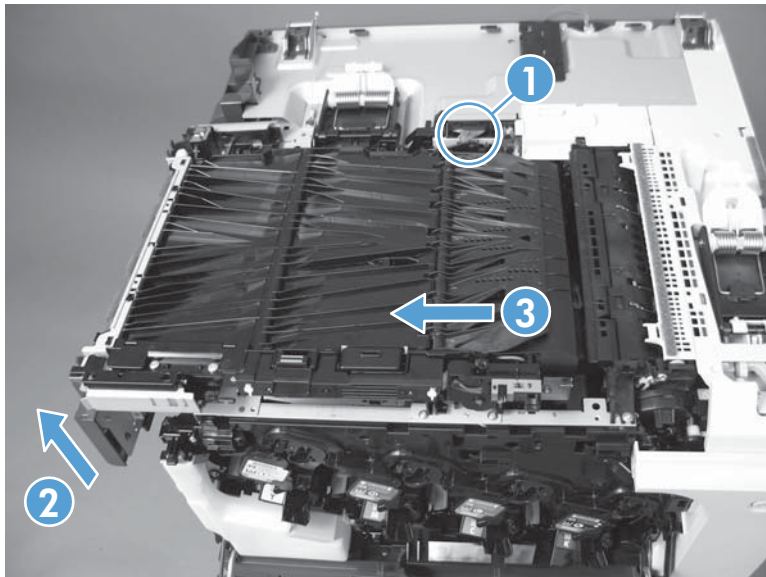
4. Remove two screws.

Figure 2-149 Remove the IPTU (4 of 5)




5. Disconnect one connector (callout 1) and then lift (callout 2) and slide the IPTU (callout 3) to remove.

Figure 2-150 Remove the IPTU (5 of 5)



Cassette feed guide

 **TIP:** If a page is jammed in the product, you might be able to access it by removing this guide.

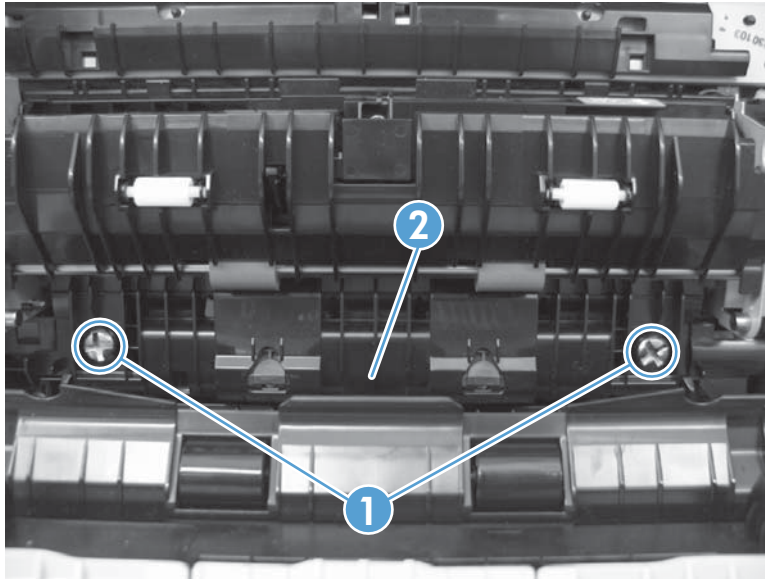
1. Open the right-door assembly.

Figure 2-151 Remove the cassette feed guide (1 of 3)



2. Remove two screws (callout 1), and then remove the cassette feed guide (callout 2).

Figure 2-152 Remove the cassette feed guide (2 of 3)




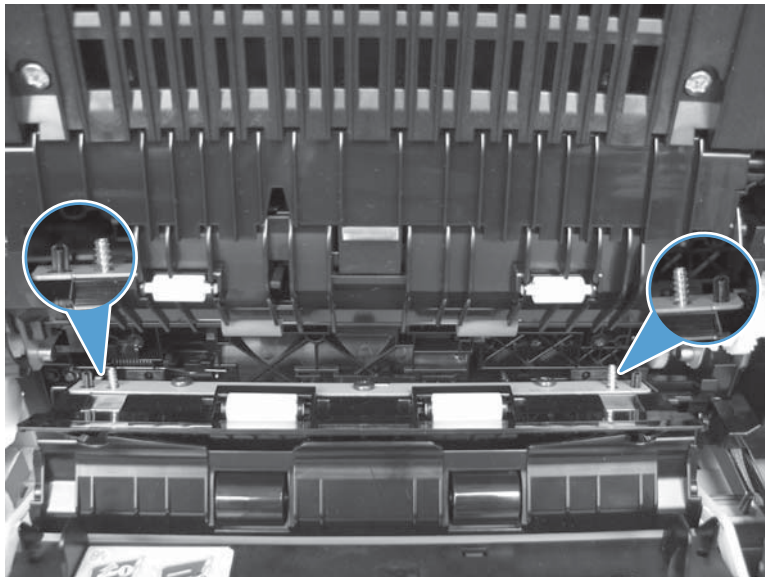
 **NOTE:** When reinstalling the cassette feed guide, make sure to correctly align each screw and pin with the corresponding hole and that the guide fits secure against the chassis.

Figure 2-153 Remove the cassette feed guide (3 of 3)



Secondary transfer assembly

The secondary transfer assembly includes the transfer roller.

1. Open the right-door assembly.

Figure 2-154 Remove the secondary transfer assembly (1 of 3)



2. Release one tab and carefully remove the stopper.


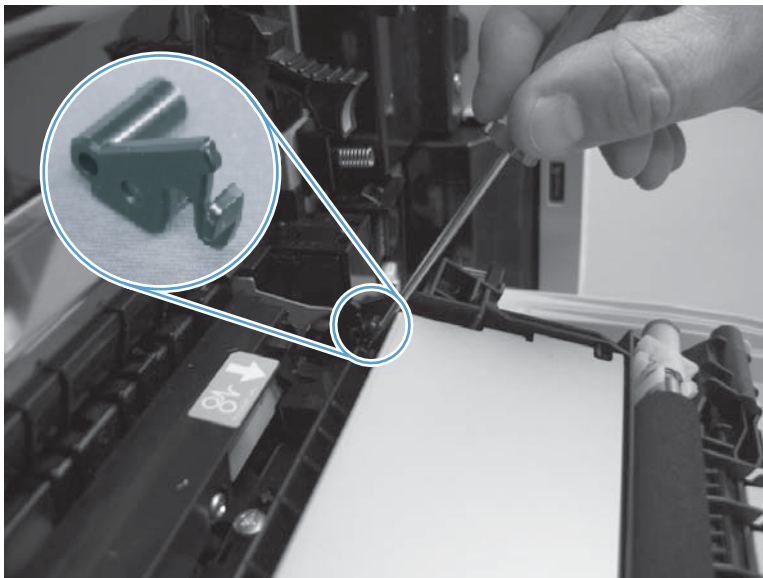
 **NOTE:** You might have to slightly lift up on the corner of the assembly to release the stopper pin from the hole in the chassis.

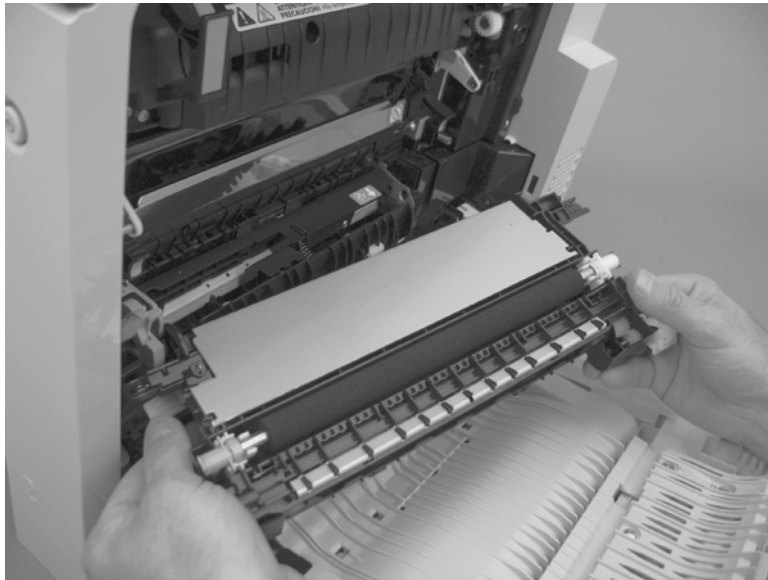
Figure 2-155 Remove the secondary transfer assembly (2 of 3)



3. Remove the secondary transfer assembly.

CAUTION: Do not damage the blue release lever when removing the assembly.

Figure 2-156 Remove the secondary transfer assembly (3 of 3)



Reinstall the secondary transfer assembly

Press and hold the blue release lever when you reinstall the assembly.

Figure 2-157 Reinstall the secondary transfer assembly



Separation pad (Tray 1)

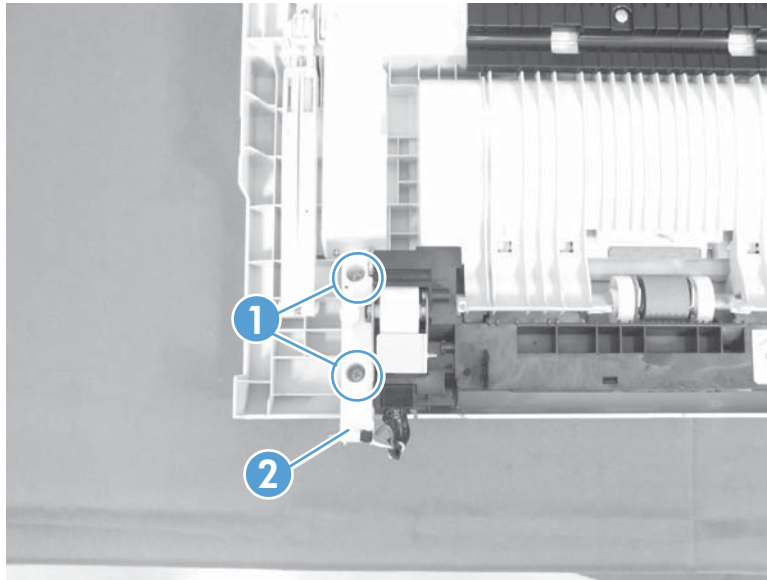
Before proceeding, remove the following components:

- Pickup roller. See [Pickup roller \(Tray 1\) on page 114](#).
- Right door assembly. See [Right-door assembly on page 145](#).

Remove the separation pad (Tray 1)

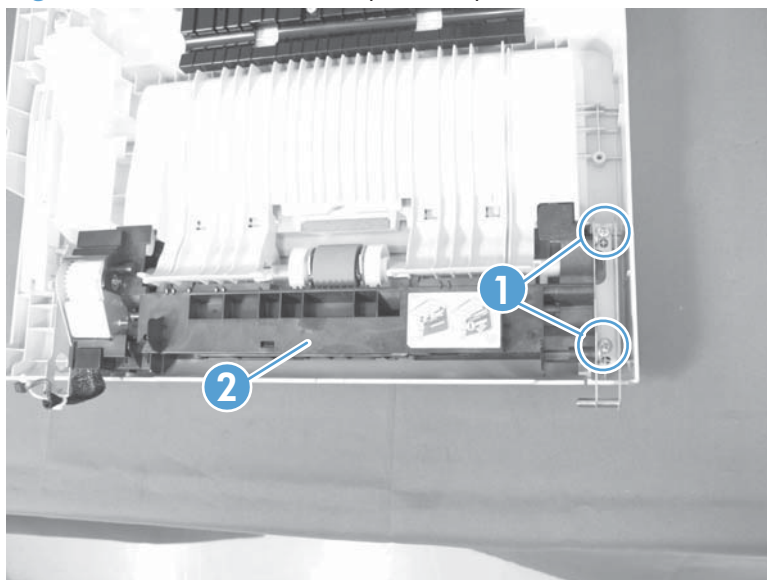
1. Remove two screws (callout 1) and the cover (callout 2).

Figure 2-158 Remove the separation pad (1 of 6)



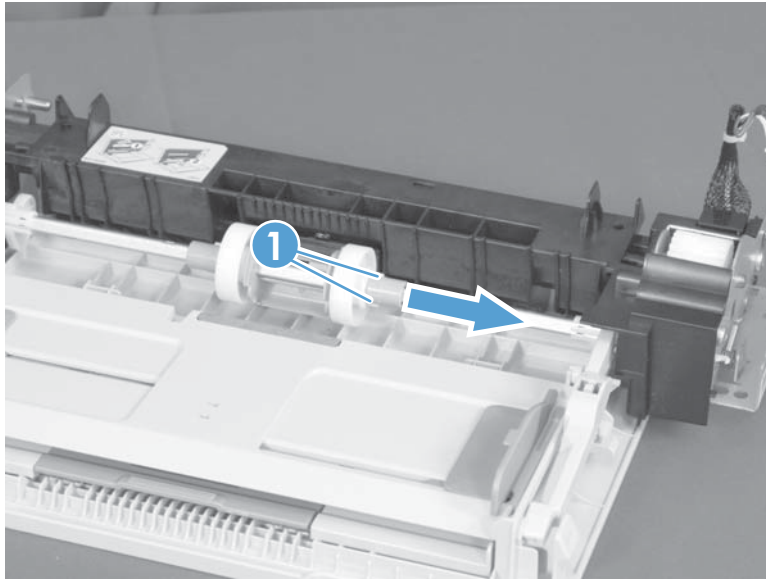
2. Remove two screws (callout 1) and separate Tray 1 (callout 2) from the door assembly.

Figure 2-159 Remove the separation pad (2 of 6)



3. Release two tabs (callout 1) and slide the locking cap and sub roller toward the edge of the tray.

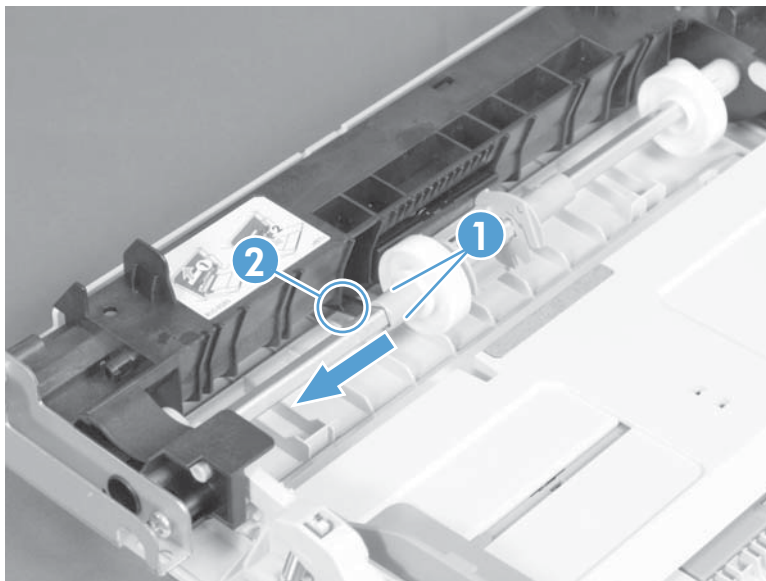
Figure 2-160 Remove the separation pad (3 of 6)



4. Release two tabs (callout 1) and slide the locking cap and sub roller toward the edge of the tray.

CAUTION: Do not damage the flag (callout 2).

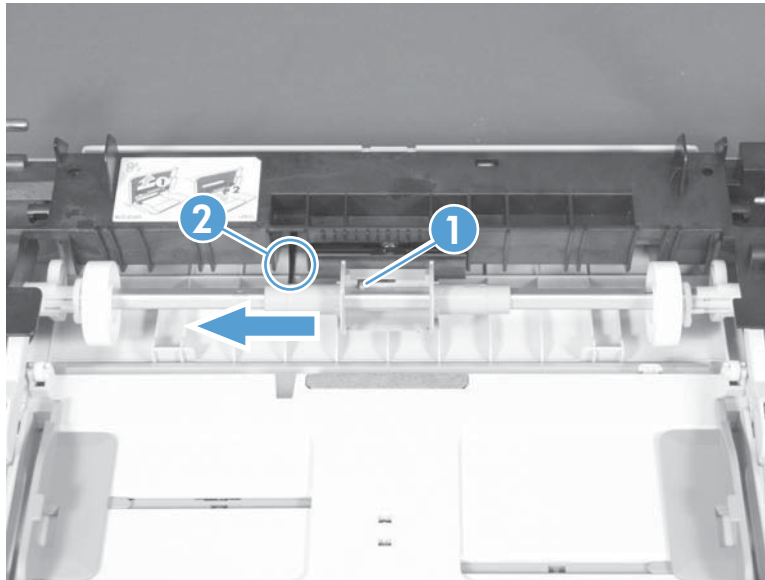
Figure 2-161 Remove the separation pad (4 of 6)



5. Release one tab (callout 1) and slide the pickup-roller holder toward the edge of the tray.

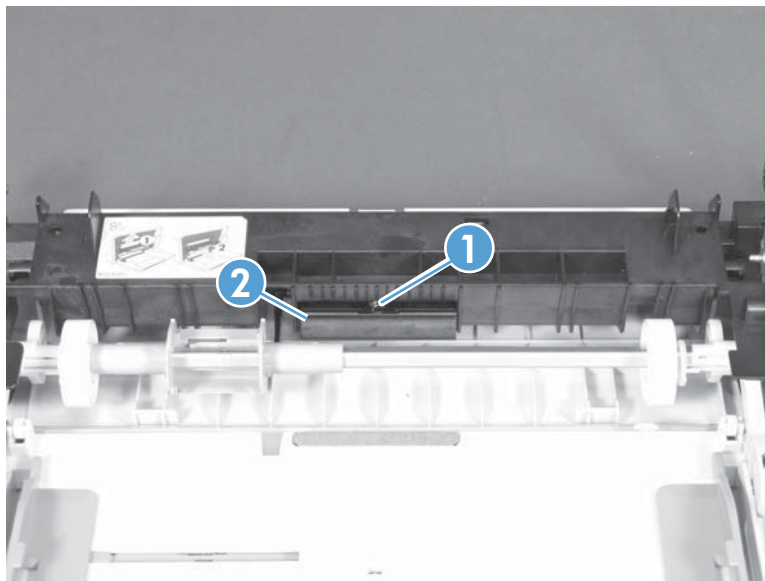
⚠ CAUTION: Do not damage the flag (callout 2).

Figure 2-162 Remove the separation pad (5 of 6)



6. Release one tab (callout 1) and remove the separation pad.

Figure 2-163 Remove the separation pad (6 of 6)



Registration density (RD) sensor assembly

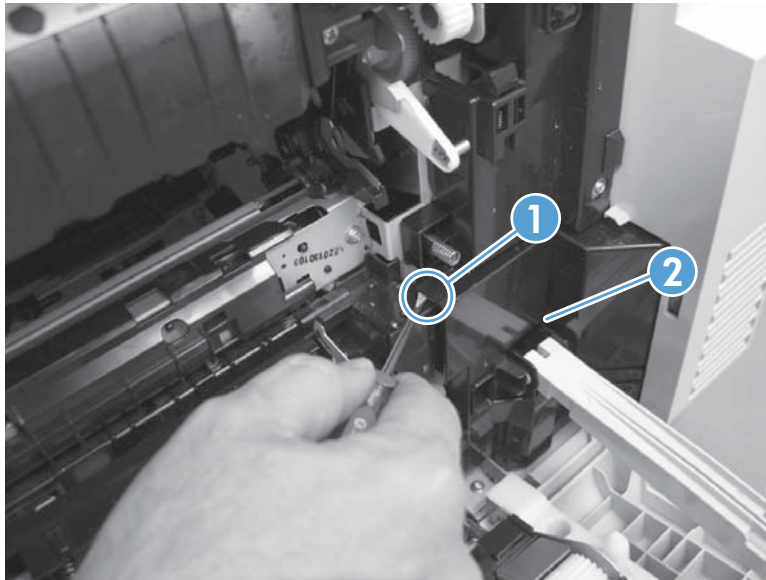
Before proceeding, remove the following components:

- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- Secondary transfer assembly. See [Secondary transfer assembly on page 204](#).

Remove the RD sensor assembly

1. Release one tab (callout 1), and then remove the cover (callout 2).

Figure 2-164 Remove the RD sensor assembly (1 of 7)




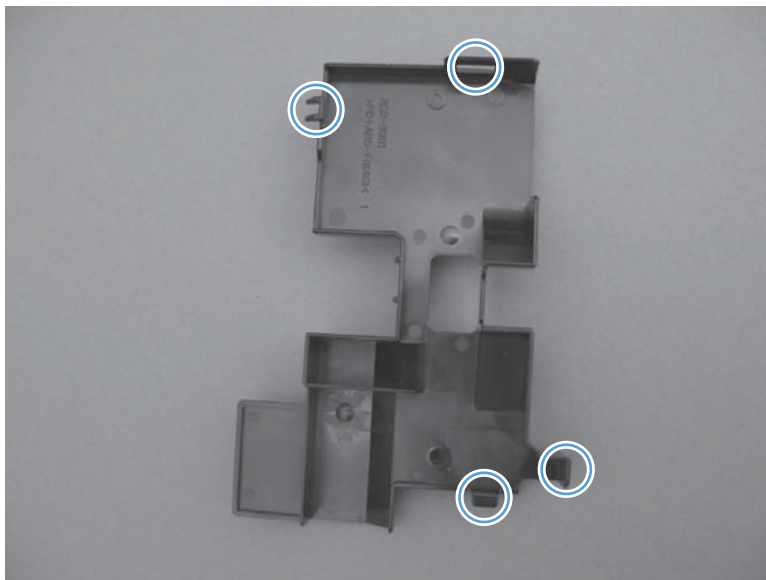
 **NOTE:** When reinstalling the cover, make sure that the tabs are seated correctly.

Figure 2-165 Remove the RD sensor assembly (2 of 7)



2. Release one tab, and then remove the wire-harness cover.


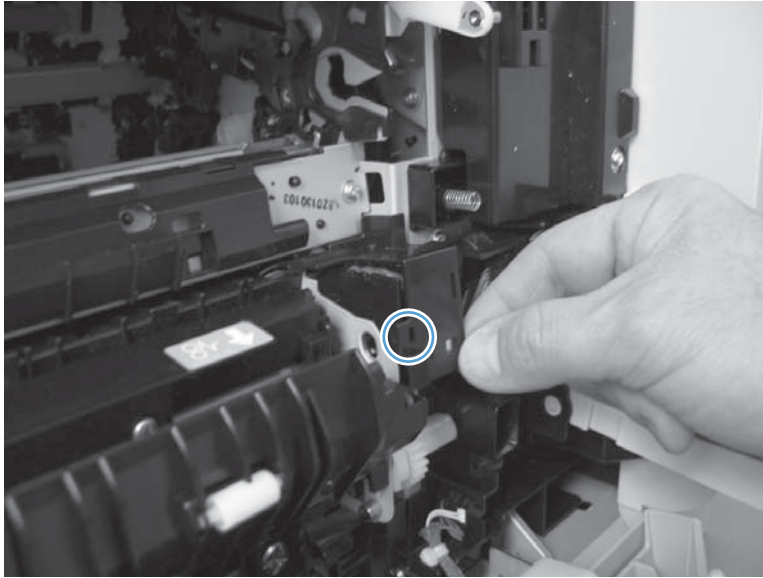
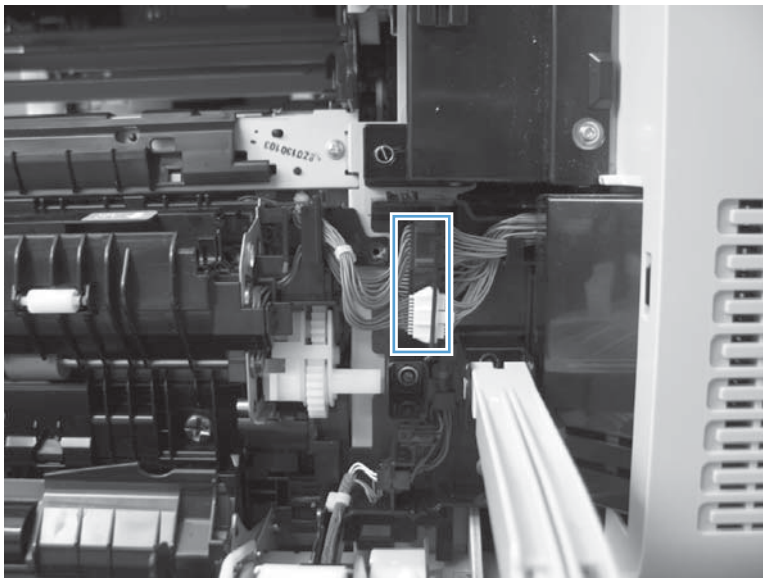
 **TIP:** Open the front door to make it easier to remove the cover.

Figure 2-166 Remove the RD sensor assembly (3 of 7)



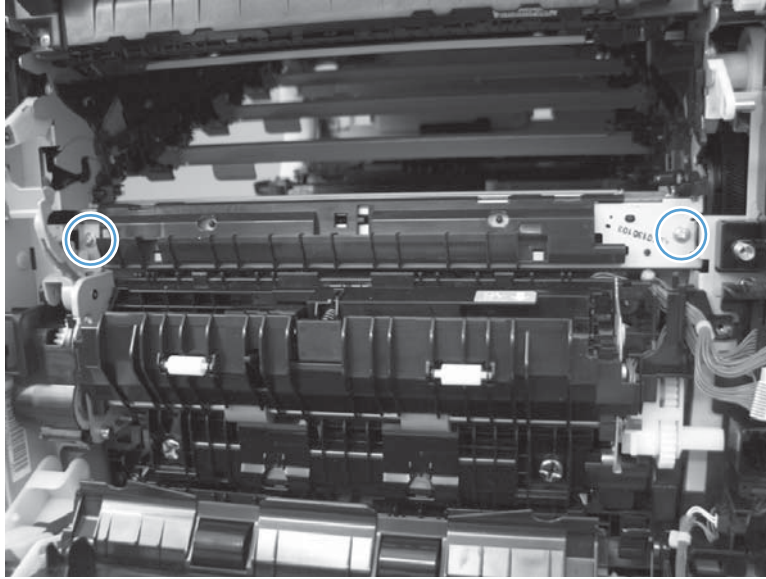
3. Disconnect three connectors.

Figure 2-167 Remove the RD sensor assembly (4 of 7)



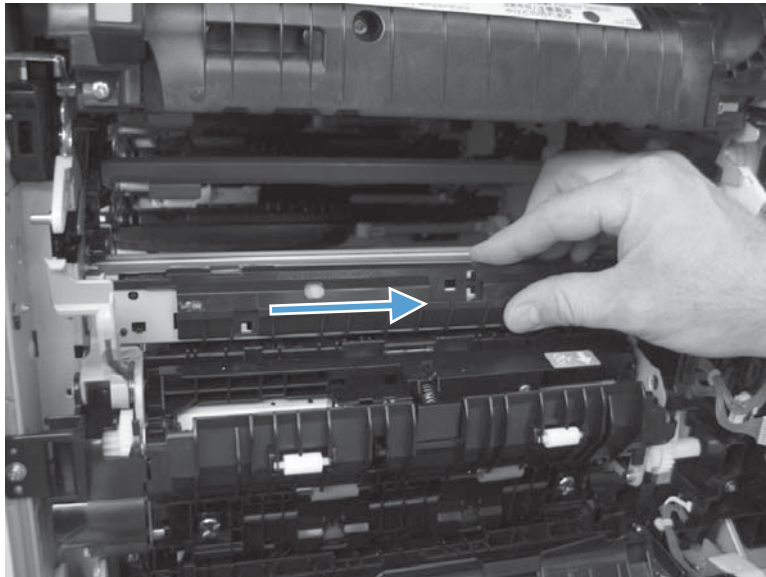
4. Remove two screws.

Figure 2-168 Remove the RD sensor assembly (5 of 7)



5. Slide the shutter toward the back side of the product. Keep the shutter in this position for the following step.

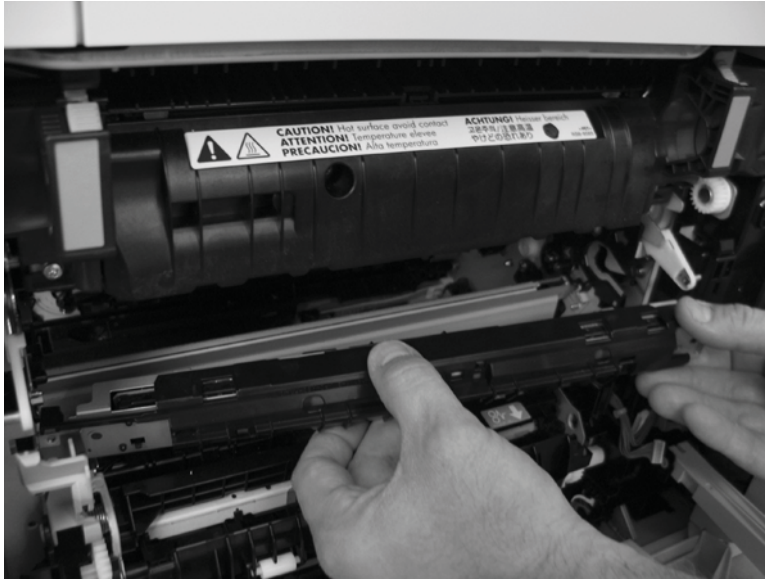
Figure 2-169 Remove the RD sensor assembly (6 of 7)



6. Carefully remove the assembly from the product.

⚠ CAUTION: Do not damage the shutter as it passes through the chassis.

Figure 2-170 Remove the RD sensor assembly (7 of 7)




Registration assembly

Before proceeding, remove the following components:

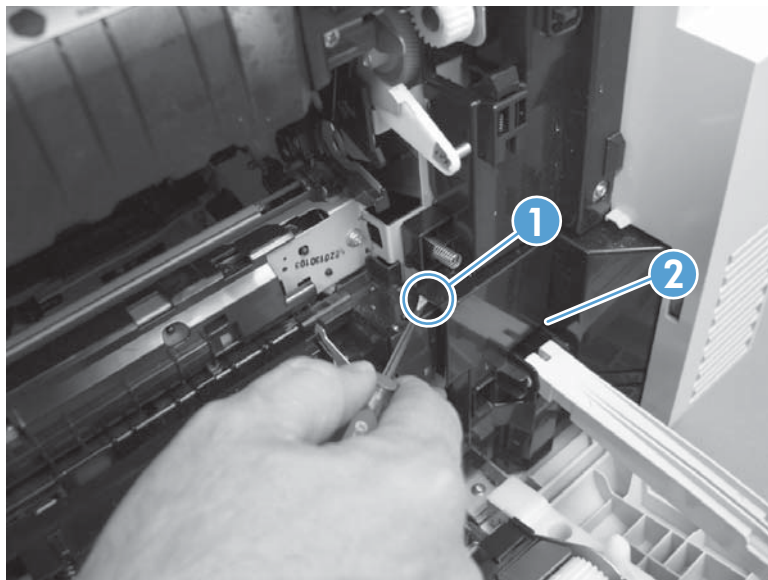
- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- Secondary transfer assembly. See [Secondary transfer assembly on page 204](#).

Remove the registration assembly

 **NOTE:** If a replacement registration assembly is installed, you must use the control-panel menus to reset the registration-roller count and input the media sensor value. See [Service menu on page 625](#).

1. Release one tab (callout 1), and then remove the cover (callout 2).

Figure 2-171 Remove the registration assembly (1 of 8)




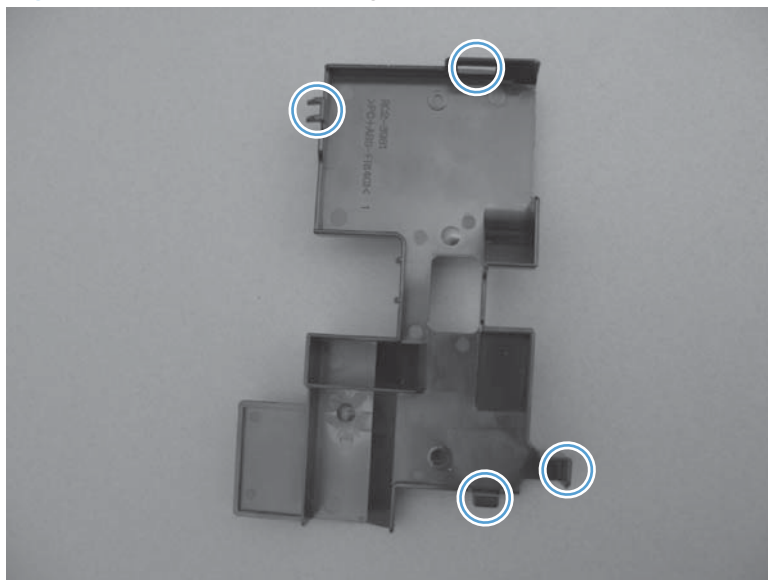
 **NOTE:** When reinstalling the cover, be sure that the tabs are seated correctly.

Figure 2-172 Remove the registration assembly (2 of 8)



2. Release one tab, and then remove the wire-harness cover.


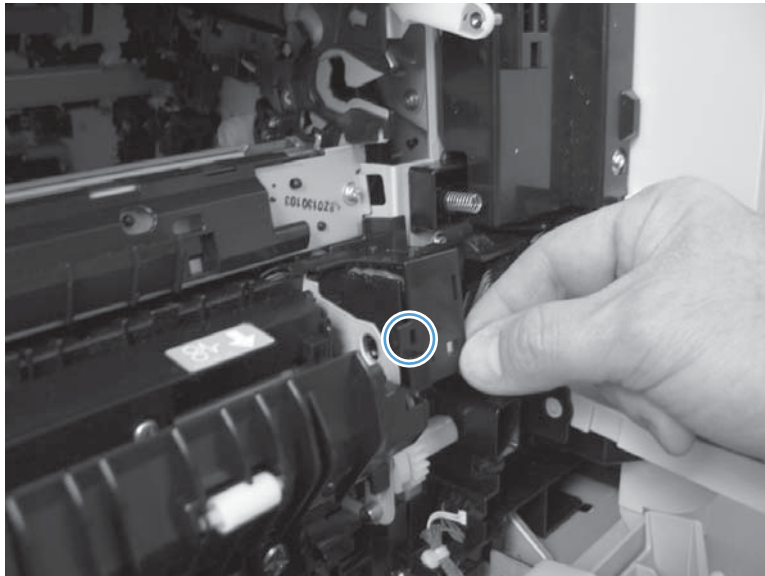
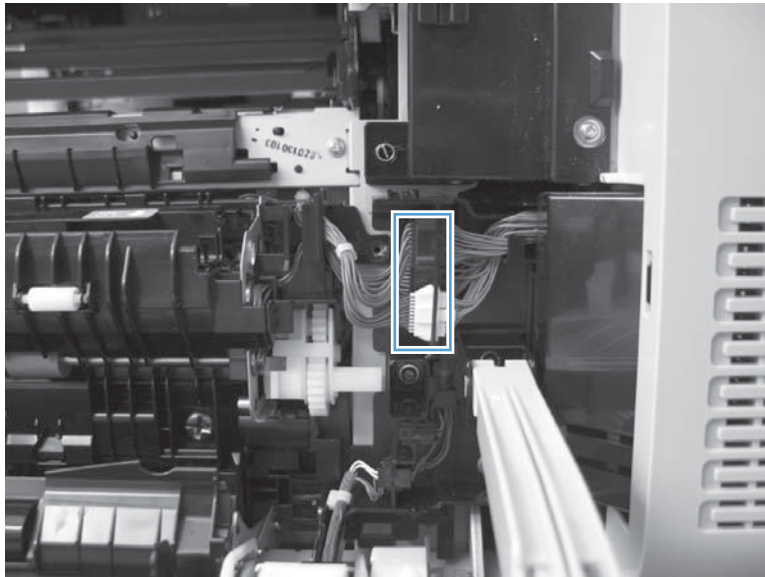
 **TIP:** To make the cover easier to remove, open the front-door assembly to close the RD-sensor shutter.

Figure 2-173 Remove the registration assembly (3 of 8)



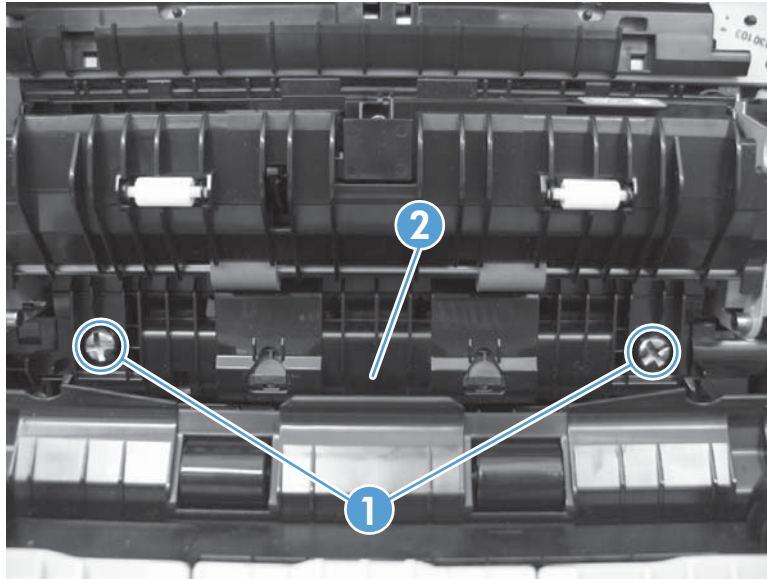
3. Disconnect two connectors.

Figure 2-174 Remove the registration assembly (4 of 8)



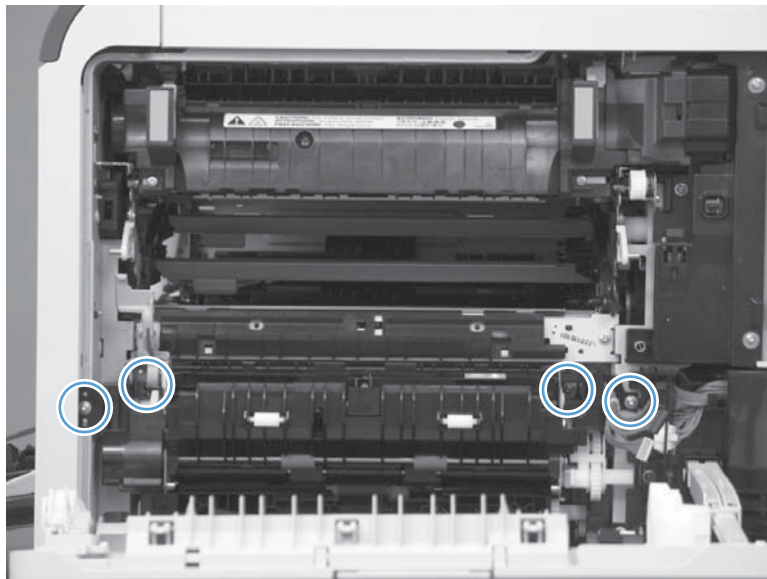
4. Remove two screws (callout 1), and then remove the cassette feed guide (callout 2).

Figure 2-175 Remove the registration assembly (5 of 8)



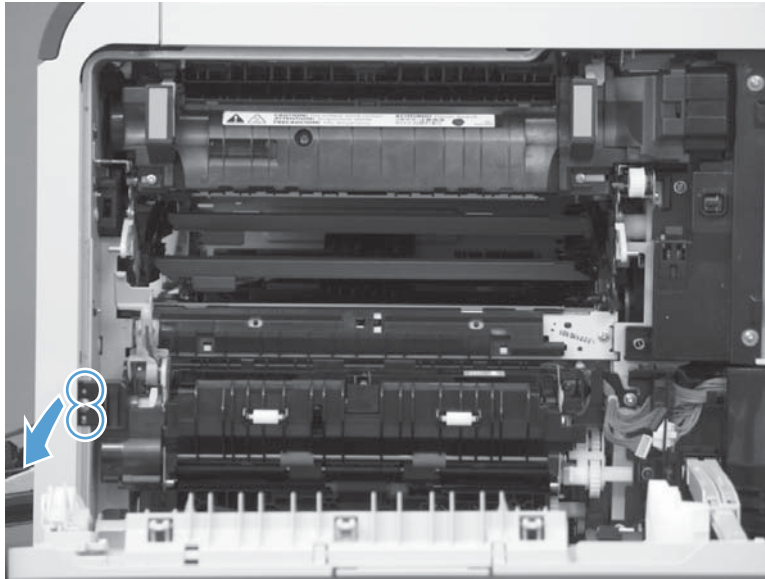
5. Remove four screws.

Figure 2-176 Remove the registration assembly (6 of 8)



6. Release two pins and the front of the assembly.

Figure 2-177 Remove the registration assembly (7 of 8)



7. Remove the assembly from the product.


 **Reinstallation tip** When you reinstall the registration assembly, make sure that it is correctly positioned in the product. The tabs on the assembly must fit into the slots in the product chassis and the assembly fits securely up against the product chassis.

Figure 2-178 Remove the registration assembly (8 of 8)



Residual-toner-feed motor

Before proceeding, remove the following components:

- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- IPTU. See [IPTU on page 199](#).
- Delivery fan. See [Delivery fan on page 228](#).

Remove the residual-toner-feed motor

Remove one screw (callout 1), disconnect one connector (callout 2), and then remove the residual-toner-feed motor (callout 3).


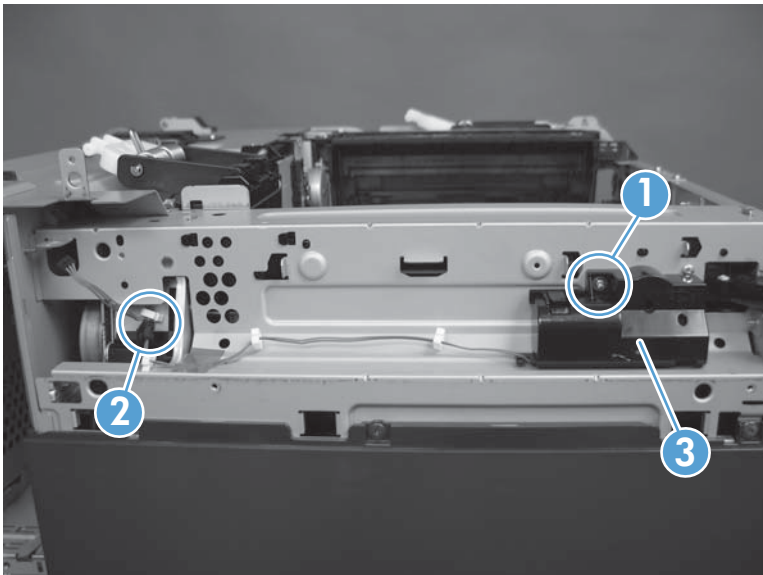
 **Reinstallation tip** When the motor (callout 3) is reinstalled, make sure that the keyed shaft on the product and motor component are correctly aligned and engaged.

Figure 2-179 Remove the residual-toner-feed motor



Residual-toner duct and feed assembly

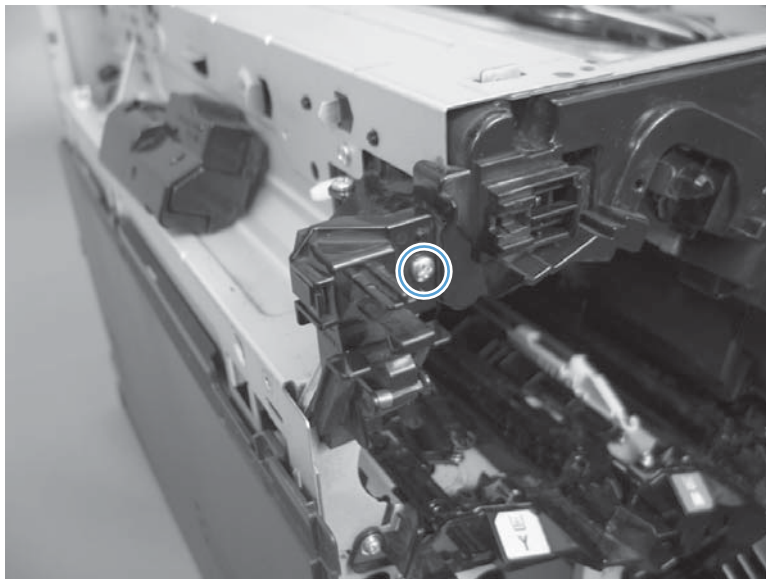
Before proceeding, remove the following components:

- Toner-collection unit. See [Toner-collection unit on page 104](#).
- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- IPTU. See [IPTU on page 199](#).
- Residual-toner-feed motor. See [Residual-toner-feed motor on page 218](#).
- Delivery fan. See [Delivery fan on page 228](#).

Remove the residual-toner duct and feed assembly

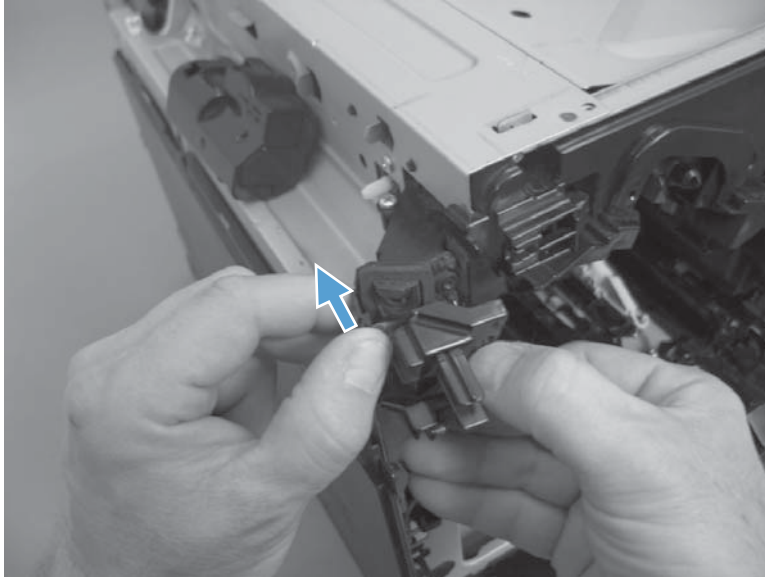
1. Remove one screw.

Figure 2-180 Remove the residual-toner duct and feed assembly (1 of 4)



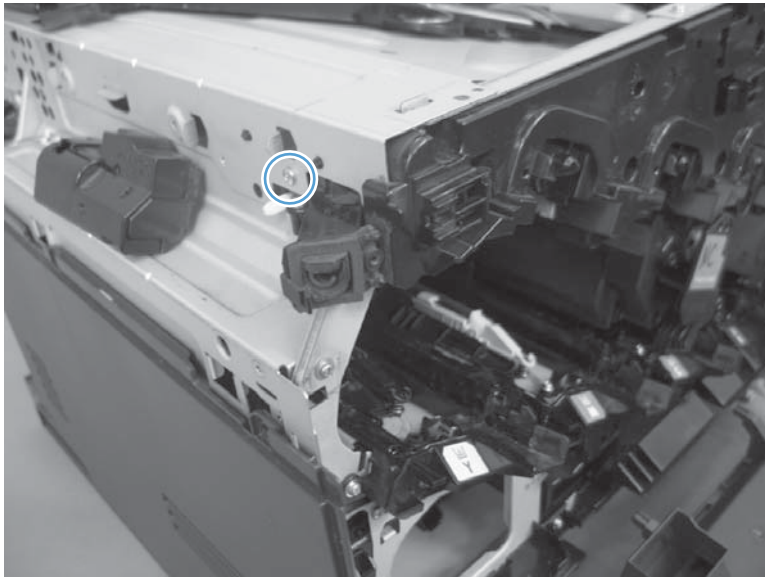
2. Release one tab, and then remove the waste toner duct.

Figure 2-181 Remove the residual-toner duct and feed assembly (2 of 4)



3. Remove one screw.

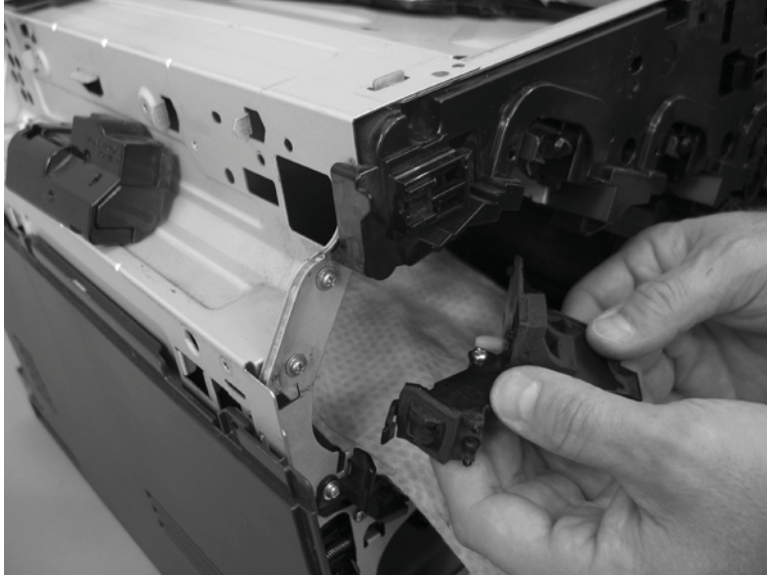
Figure 2-182 Remove the residual-toner duct and feed assembly (3 of 4)



4. Push the residual-toner feed assembly into the product and then remove through the print cartridge cavity.

CAUTION: The waste toner feed assembly contains toner. Place a cloth below the work area to catch any spilled toner.

Figure 2-183 Remove the residual-toner duct and feed assembly (4 of 4)



Cartridge fan and environmental sensor

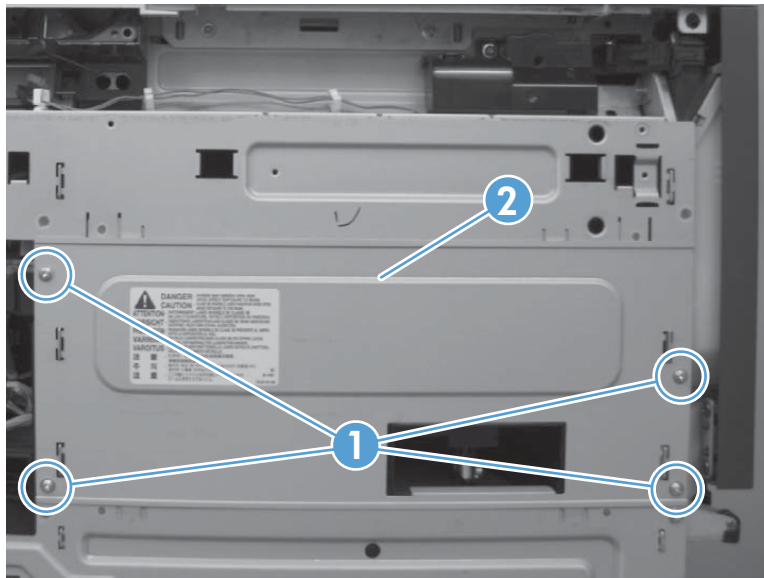
Before proceeding, remove the following components:

- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).

Remove the cartridge fan and environmental sensor

1. Remove four screws (callout 1), and then remove the sheet-metal plate (callout 2).

Figure 2-184 Remove the cartridge fan and environmental sensor (1 of 7)



2. Release one spring.


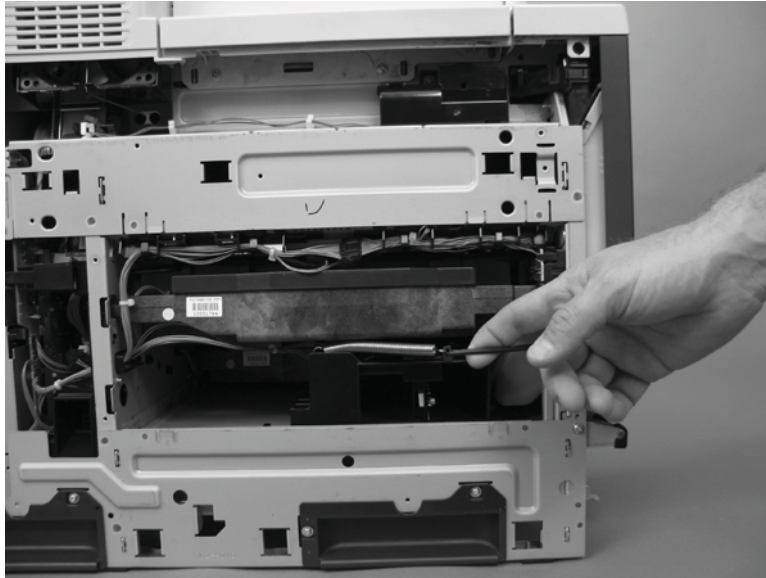
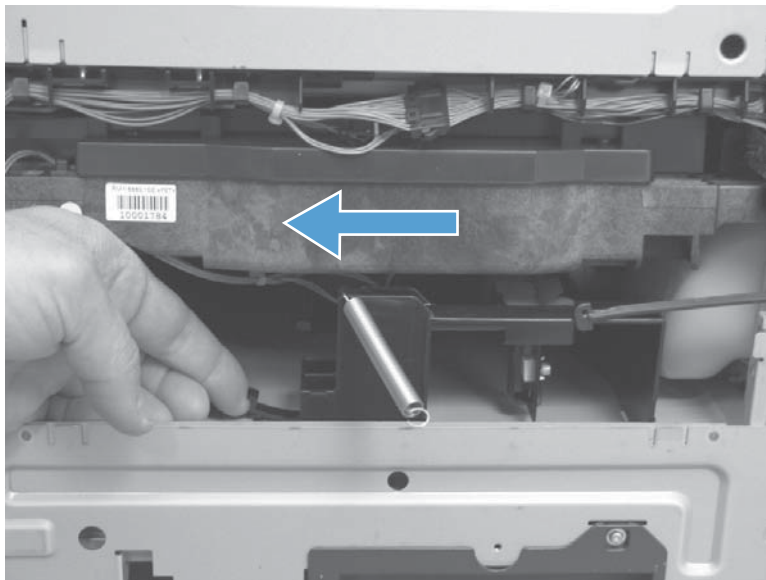
 **TIP:** Close the front-door assembly to reduce tension in the spring.

Figure 2-185 Remove the cartridge fan and environmental sensor (2 of 7)



3. Release one tab and then slide the fan assembly toward the back of the product.

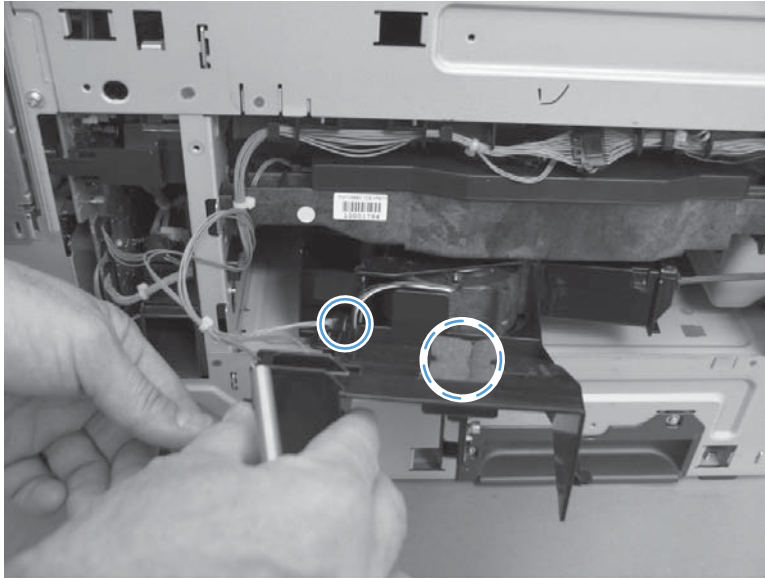
Figure 2-186 Remove the cartridge fan and environmental sensor (3 of 7)



4. Pull the fan assembly out of the product, and then disconnect two connectors.

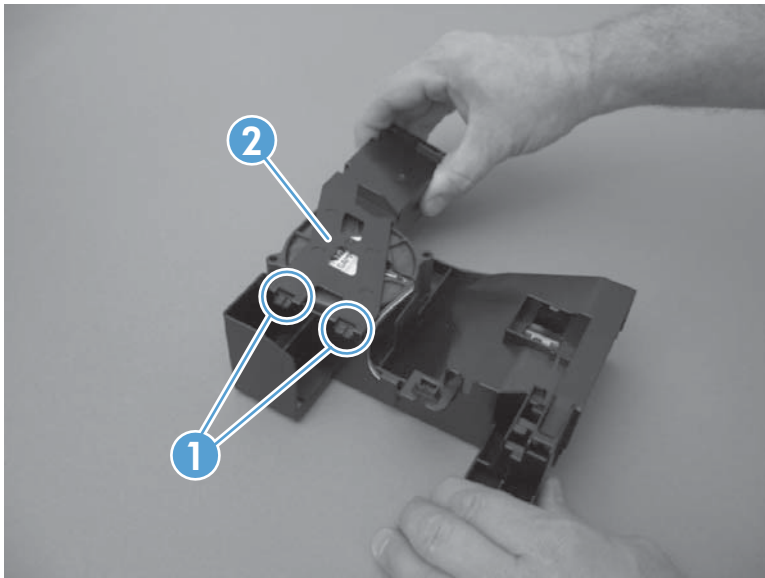
 **TIP:** One connector is below the sponge.

Figure 2-187 Remove the cartridge fan and environmental sensor (4 of 7)



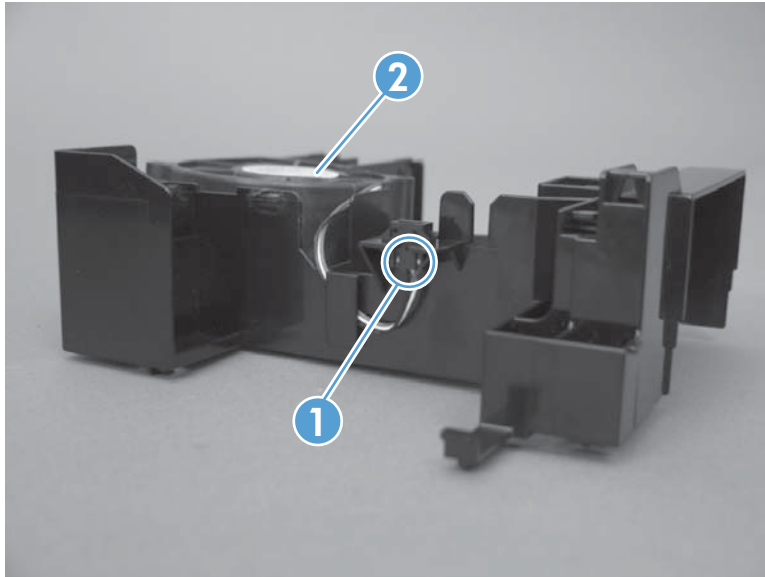
5. Release two tabs (callout 1), and then remove the cover (callout 2).

Figure 2-188 Remove the cartridge fan and environmental sensor (5 of 7)



6. Disconnect one connector (callout 1), and then remove the fan (callout 2).

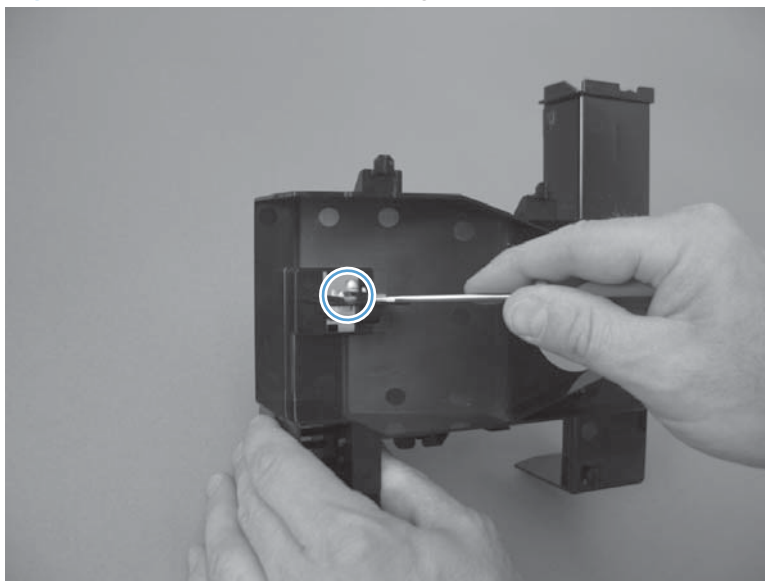
Figure 2-189 Remove the cartridge fan and environmental sensor (6 of 7)



7. Carefully release one tab, and then remove the environmental sensor.

CAUTION:  ESD-sensitive part.

Figure 2-190 Remove the cartridge fan and environmental sensor (7 of 7)



Toner-collection sensor and scanner-thermistor assembly

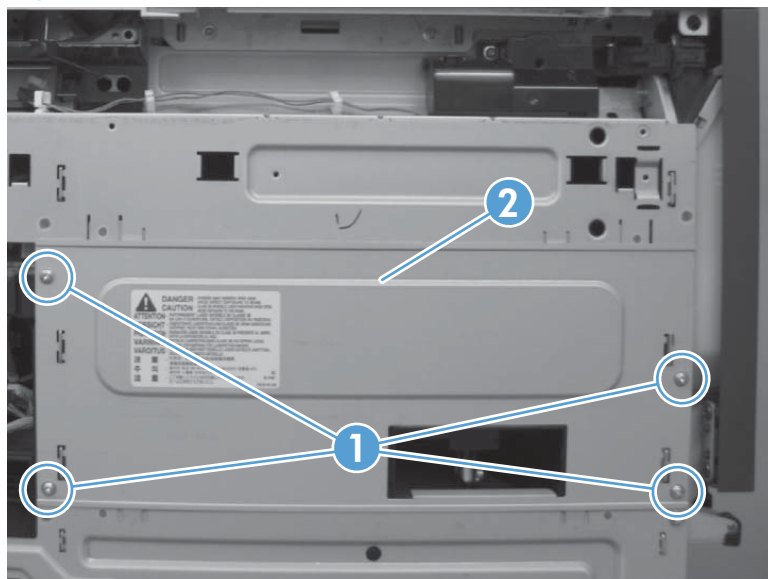
Before proceeding, remove the following components:

- Toner-collection unit. See [Toner-collection unit on page 104](#).
- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Fan cover. See [Fan cover on page 134](#).
- Left cover. See [Left cover on page 137](#).

Remove the toner-collection sensor and scanner-thermistor assembly

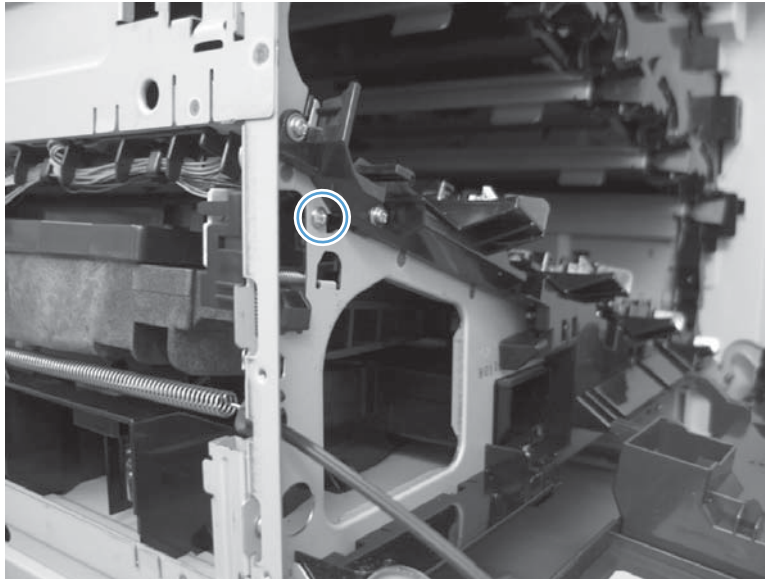
1. Remove four screws (callout 1), and then remove the sheet-metal plate (callout 2).

Figure 2-191 Remove the toner-collection sensor and scanner-thermistor assembly (1 of 3)



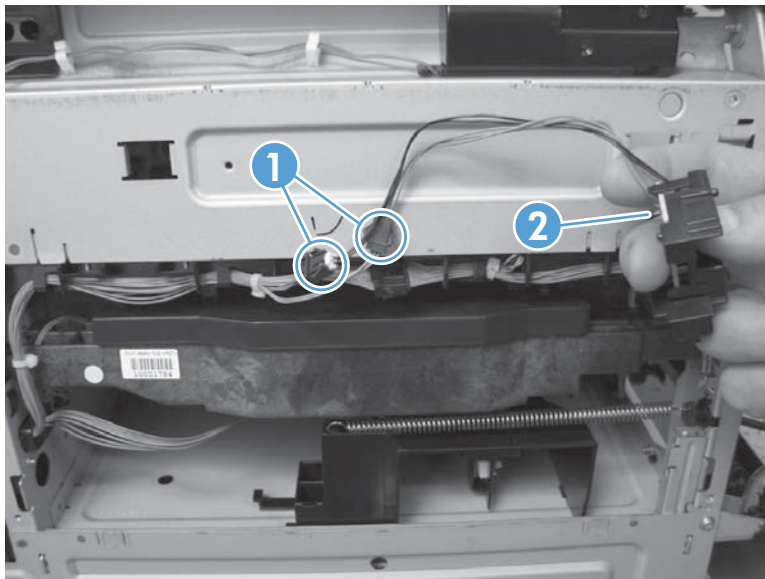
2. Open the front-door assembly, and then remove one screw.

Figure 2-192 Remove the toner-collection sensor and scanner-thermistor assembly (2 of 3)



3. Disconnect two connectors (callout 1), and then remove the toner-collection sensor and scanner-thermistor assembly (callout 2).

Figure 2-193 Remove the toner-collection sensor and scanner-thermistor assembly (3 of 3)



Delivery fan

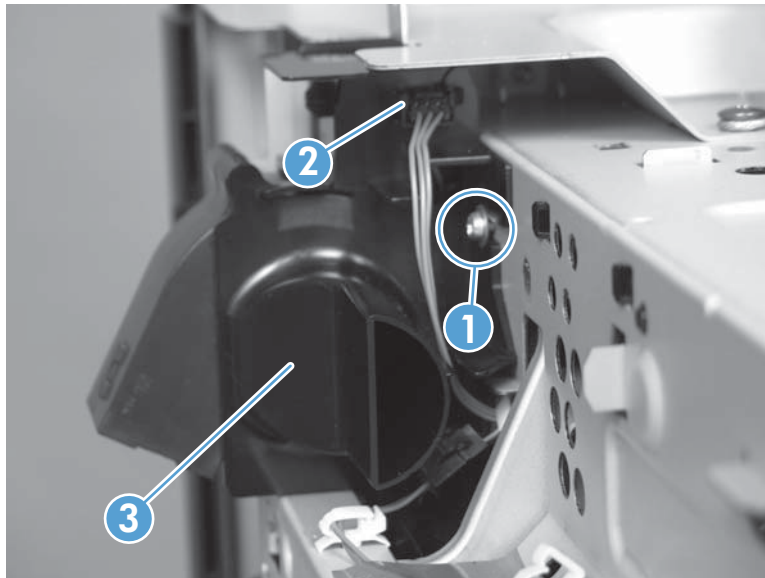
Before proceeding, remove the following components:


- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Fan cover. See [Fan cover on page 134](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- IPTU. See [IPTU on page 199](#).

Remove the delivery fan

- ▲ Remove one screw (callout 1), disconnect one connector (callout 2) and then remove the fan (callout 3).

Figure 2-194 Remove the delivery fan



 **TIP:** When the fan is reinstalled, the air must flow into the product. Check the arrows embossed on the fan frame that indicate air flow direction.

Intermediate cover and duplexing gear cover

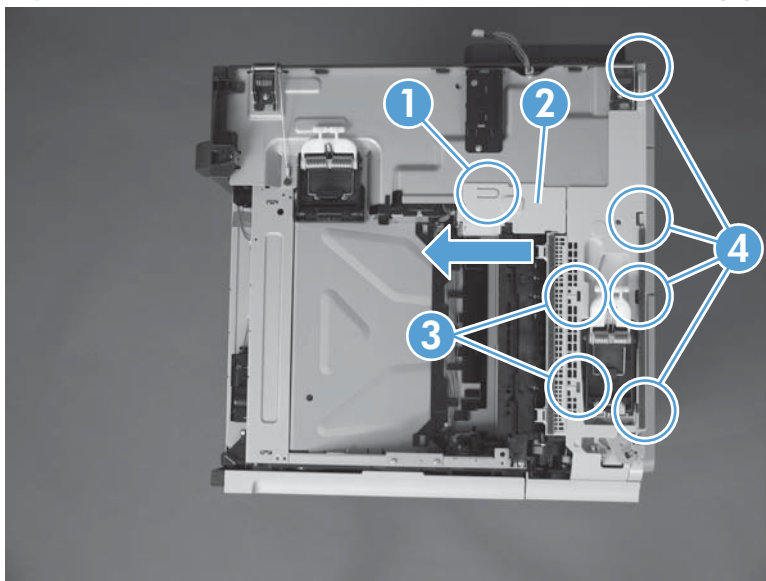
Before proceeding, remove the following components:

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).

Remove the Intermediate cover and duplexing gear cover

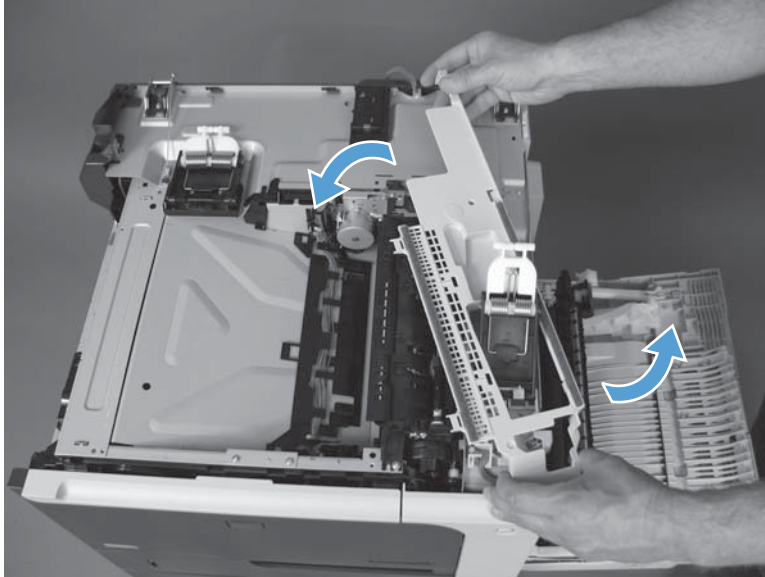
1. Open the right door. Release one pry point (callout 1). Slide the duplexing gear cover (callout 2) to the left to remove. Release two pry points (callout 3) and then release four pry points (callout 4).

Figure 2-195 Remove the intermediate cover and duplexing gear cover (1 of 2)



2. Rotate the intermediate cover and remove.

Figure 2-196 Remove the intermediate cover and duplexing gear cover (2 of 2)



Delivery assembly

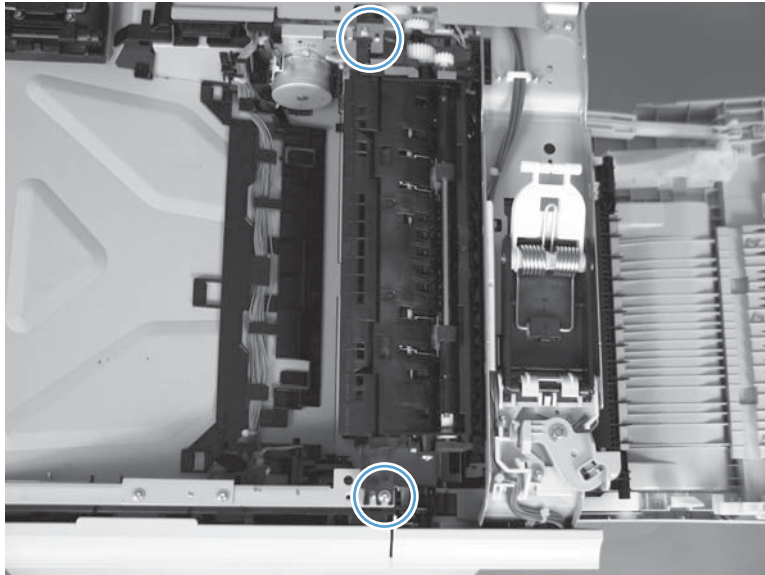
Before proceeding, remove the following components:

- Fuser. See [Fuser on page 112](#).
- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Fan cover. See [Fan cover on page 134](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- IPTU. See [IPTU on page 199](#).
- Intermediate cover and duplexing gear cover. See [Intermediate cover and duplexing gear cover on page 229](#).

Remove the delivery assembly

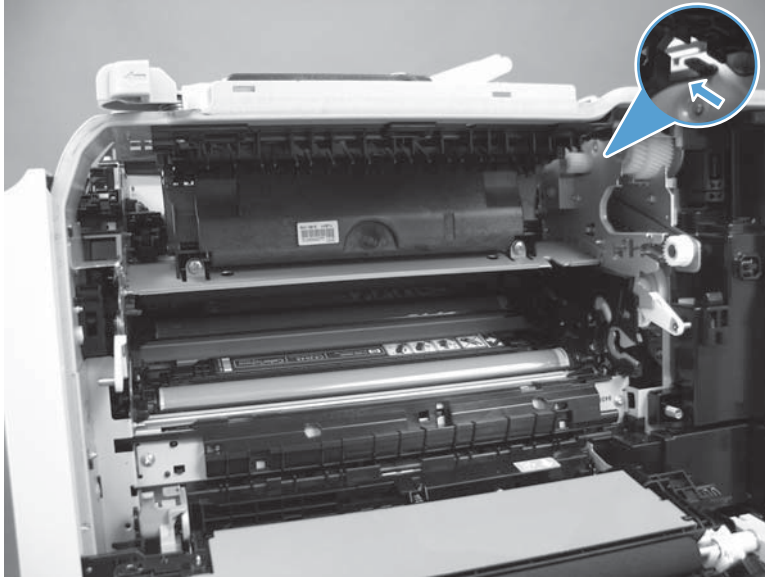
1. Remove two screws.


Figure 2-197 Remove the delivery assembly (1 of 4)



2. Pull one tab out, and then push the tab down to release the bushing.

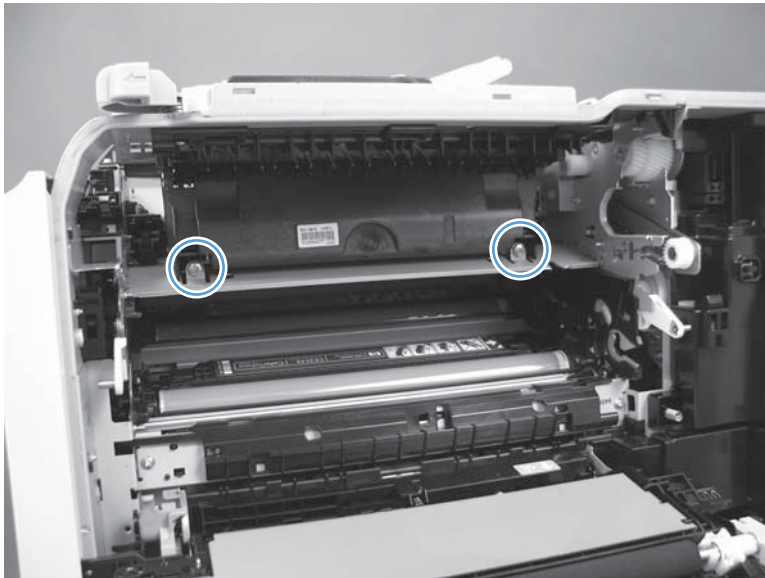
Figure 2-198 Remove the delivery assembly (2 of 4)



 **NOTE:** When reinstalling, make sure the tab is correctly installed and flush against the chassis.

3. Remove two screws.

Figure 2-199 Remove the delivery assembly (3 of 4)



4. Remove the assembly.

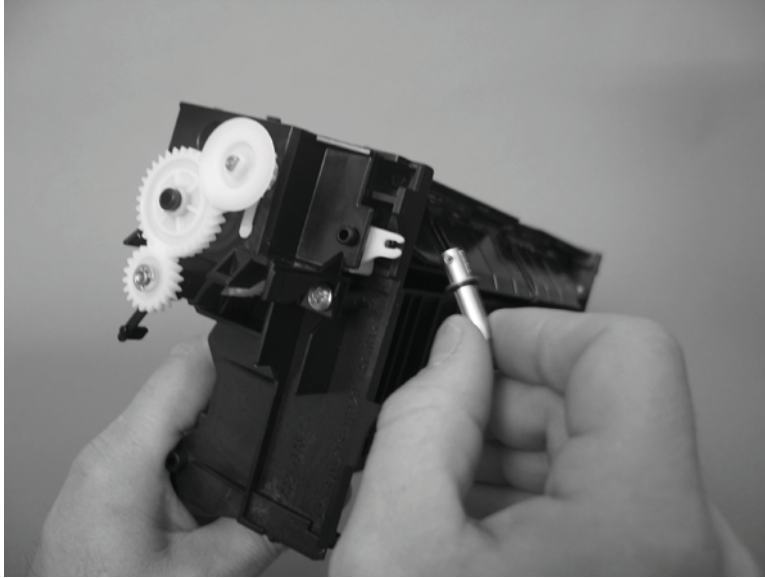
Figure 2-200 Remove the delivery assembly (4 of 4)



Reinstall the delivery assembly

- ▲ Make sure that the solenoid plunger is correctly installed on the replacement assembly.

Figure 2-201 Reinstall the delivery assembly



Duplex-drive assembly

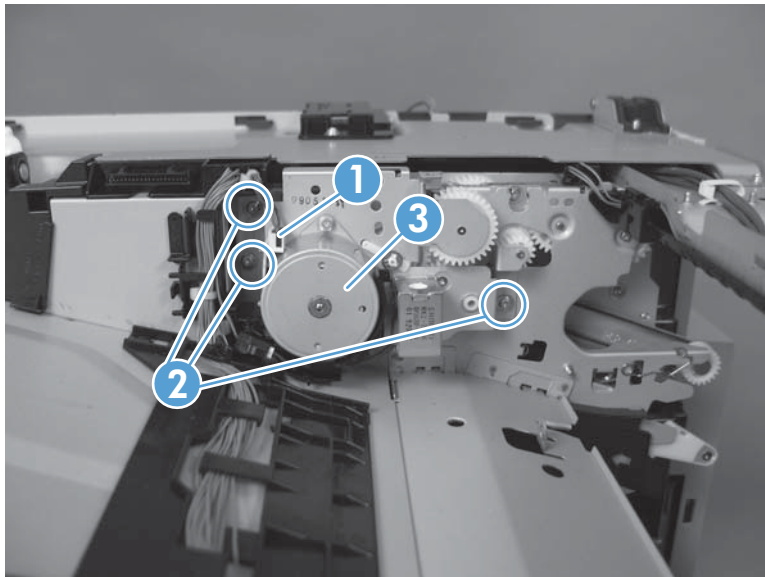
Before proceeding, remove the following components:

- Fuser. See [Fuser on page 112](#).
- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- S-CVR-LEFT (scanner left cover). See [S-CVR-LEFT \(scanner left cover\) on page 133](#).
- Fan cover. See [Fan cover on page 134](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- IPTU. See [IPTU on page 199](#).
- Delivery assembly. See [Delivery assembly on page 231](#).

Remove the duplex-drive assembly

- ▲ Disconnect one connector (callout 1), remove three screws (callout 2), and then remove the assembly (callout 3).

Figure 2-202 Remove the duplex-drive assembly



Power-supply fan

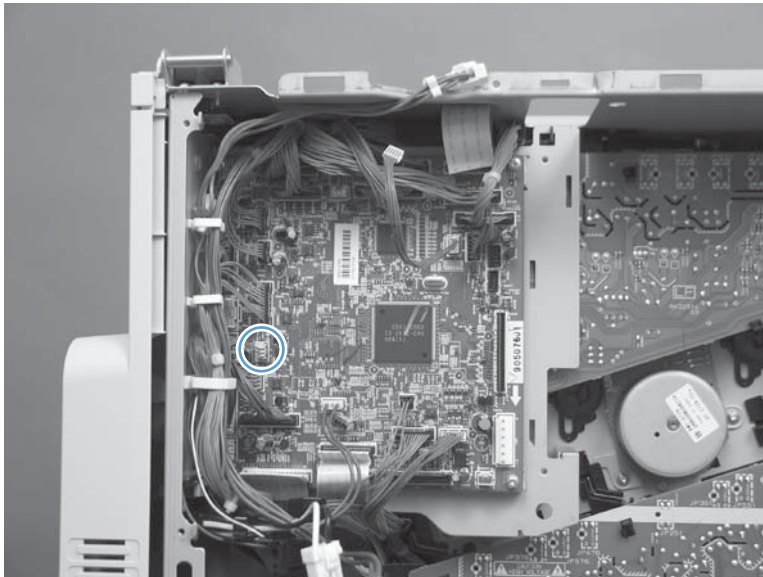
Before proceeding, remove the following components:

- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Rear cover. See [Rear cover on page 144](#).
- Image scanning power supply unit. See [Image scanner power supply unit \(PSU\) on page 237](#).

Remove the power-supply fan

1. Release the fan cable from the DC controller.

Figure 2-203 Remove the power-supply fan (1 of 2)



2. Release one tab (callout 1), and then remove the fan (callout 2) from the fan duct.


 **Reinstallation tip** When the fan is reinstalled, the air must flow into the product. Check the arrows embossed on the fan frame that indicate air flow direction.

Figure 2-204 Remove the power-supply fan (2 of 2)

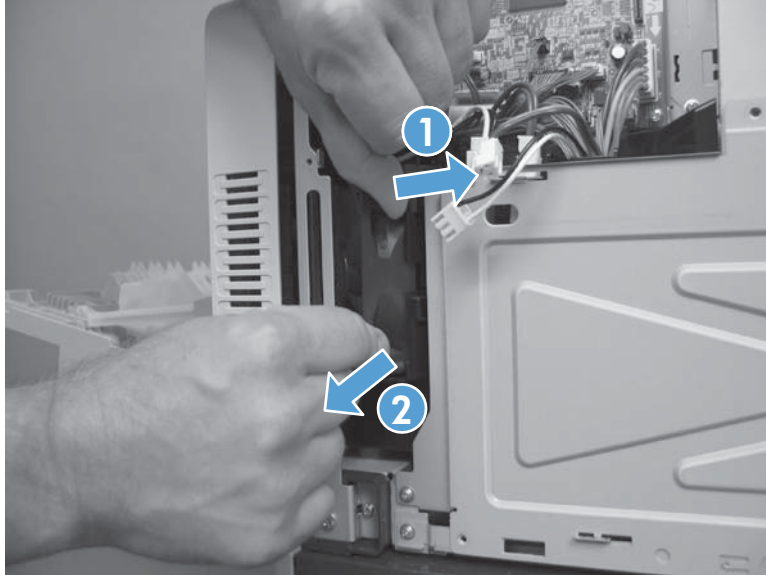


Image scanner power supply unit (PSU)

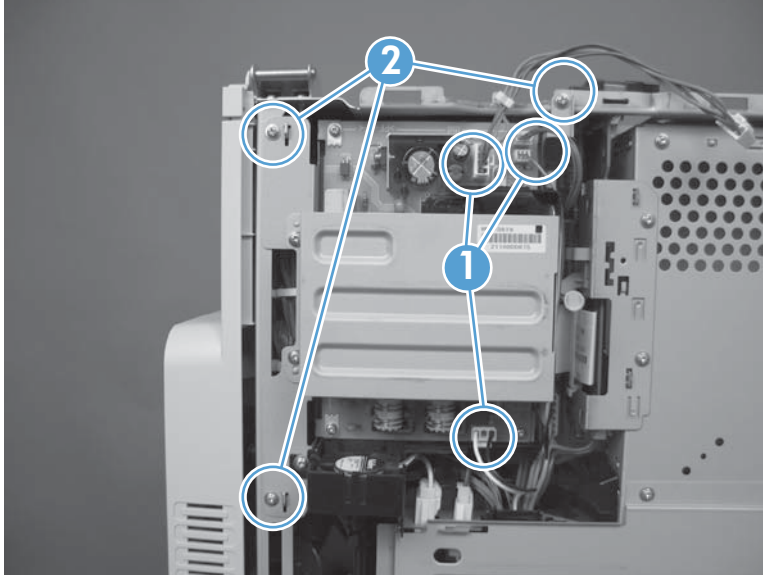
Before proceeding, remove the following components

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Fan cover. See [Fan cover on page 134](#).
- Rear cover. See [Rear cover on page 144](#).

Remove the image scanner supply unit (PSU) and fan

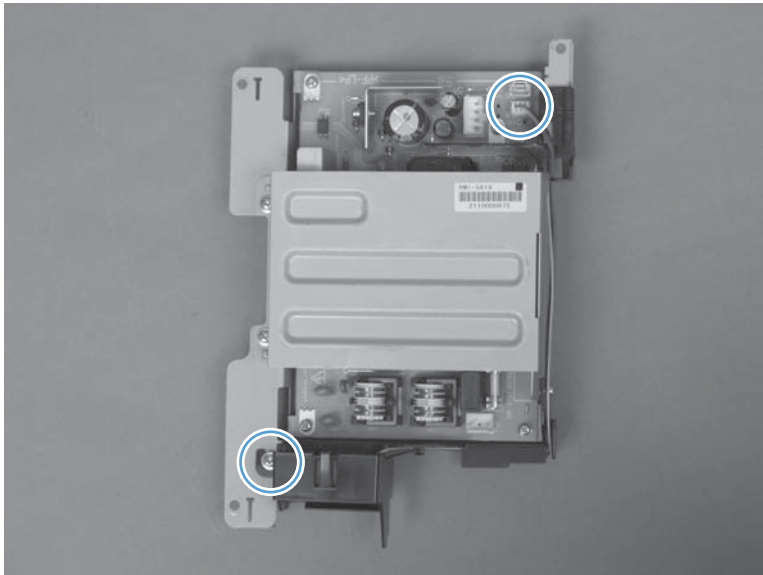
1. Disconnect three connectors (callout 1), remove three screws (callout 2), and then remove the image scanner supply unit (PSU).

Figure 2-205 Remove the image scanner supply unit (PSU) and fan (1 of 2)



2. Remove one screw, disconnect one connector, and then remove the fan.

Figure 2-206 Remove the image scanner supply unit (PSU) and fan (2 of 2)



Interconnect board (ICB)

Before proceeding, remove the following components:

- Formatter. See [Formatter PCA on page 106](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply unit (PSU). See [Image scanner power supply unit \(PSU\) on page 237](#).

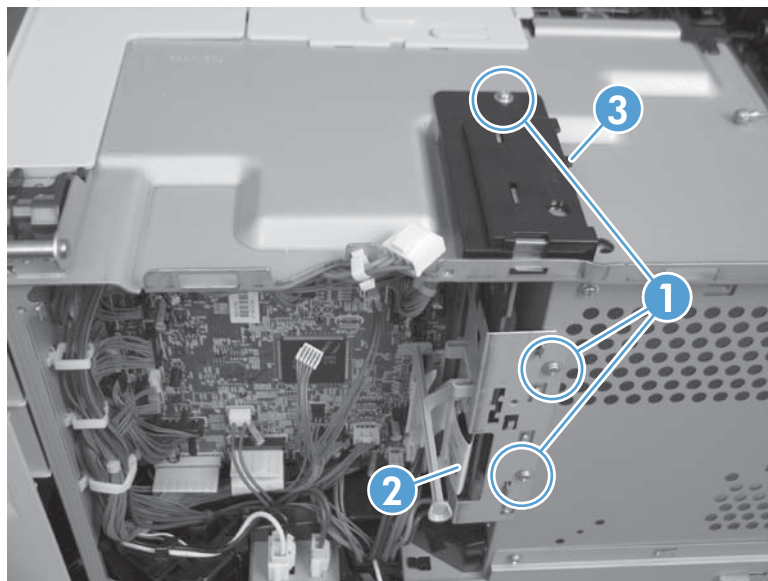
Remove the ICB

⚠ WARNING! Do not remove the ICB from a product and then install it into a **different** product. Failure to follow this warning will result in severe damage to that product and cause it to be unusable. HP recommends that if you remove and replace the ICB, you should destroy the discarded ICB so that it can not accidentally be installed in a different product.

⚠ CAUTION:  ESD-sensitive part.

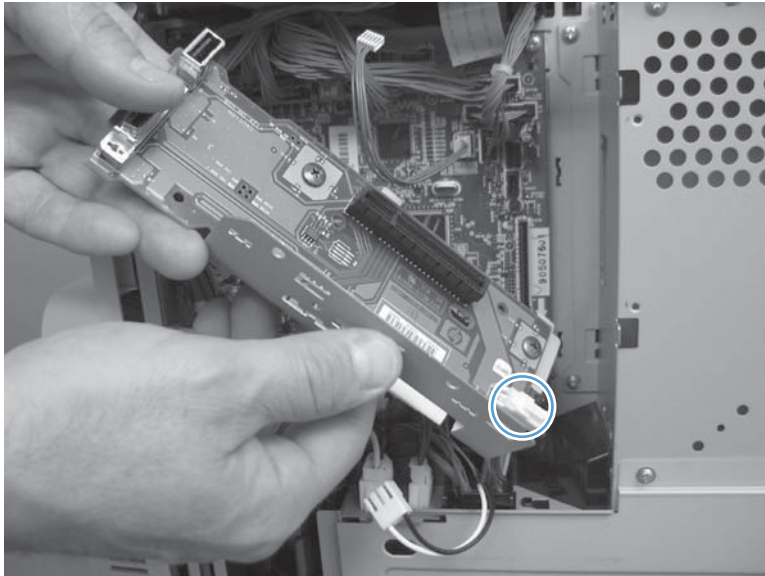
1. Remove three screws (callout 1), disconnect one FFC (callout 2), and remove the small cover (callout 3).

Figure 2-207 Remove the ICB (1 of 2)




2. Carefully rotate and slide the ICB up and away from the chassis, disconnect one connector, and then remove the ICB.

Figure 2-208 Remove the ICB (2 of 2)



DC controller PCA only


 **NOTE:** Use the following procedure to replace **only** the DC controller PCA. To access components behind the DC controller, remove the PCA and the sheet-metal backing tray. See [DC controller PCA and tray on page 248](#).

Before proceeding, remove the following components:

- Standard output bin. See [Standard output bin on page 123](#).
- Output bin bezel. See [Output bin bezel on page 124](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Fan cover. See [Fan cover on page 134](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply unit (PSU). See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).

Remove the DC controller PCA only

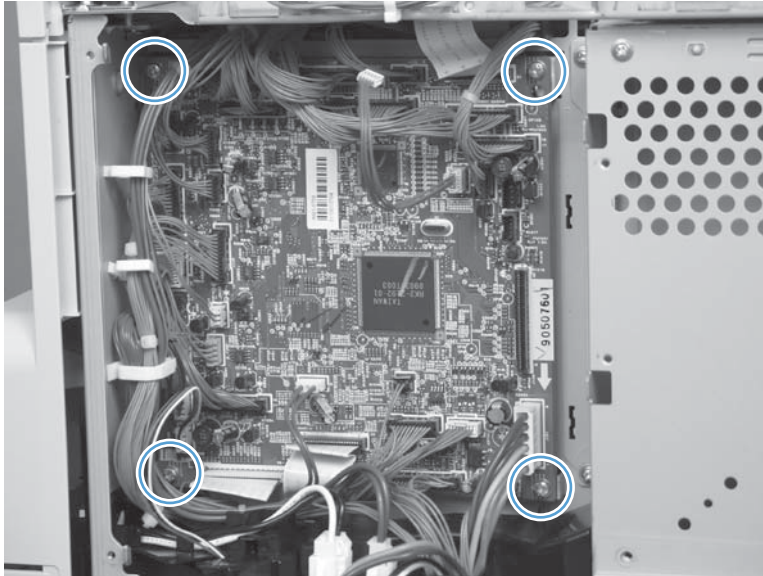
 **CAUTION:**  ESD-sensitive part.

 **NOTE:** To locate DC controller connector locations, see [DC controller connector locations on page 432](#). There are 34 connectors in all.

- ▲ Disconnect all the connectors. Remove four screws and then remove the DC controller PCA

 **Reinstallation tip** The connector locations J101 and J102 are not used.

Figure 2-209 Remove the DC controller PCA only



Low-voltage power supply (LVPS)

Before proceeding, remove the following components:

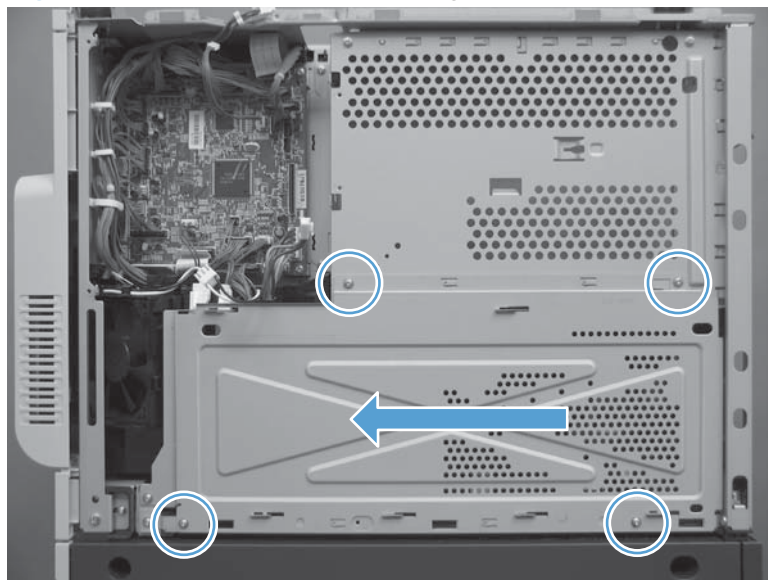
- Formatter. See [Formatter PCA on page 106](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Fan cover. See [Fan cover on page 134](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply. See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).

Remove the low-voltage power supply

CAUTION:  ESD-sensitive part.

1. Remove four screws, and then slide the sheet-metal plate toward the back of the product to remove.

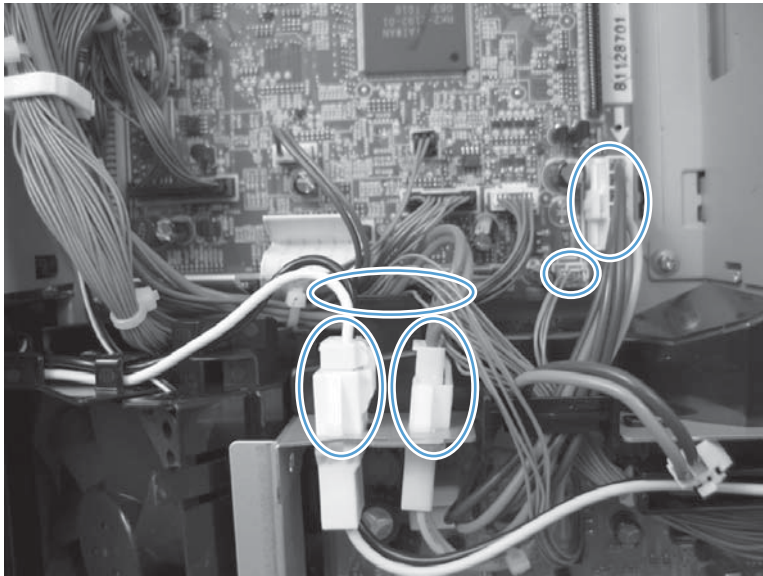
Figure 2-210 Remove the low-voltage power supply (1 of 8)



2. Disconnect five connectors, and then release the wire harnesses from the guides as necessary.

 **NOTE:** To locate DC controller connector locations, see [DC controller connector locations on page 432](#).

Figure 2-211 Remove the low-voltage power supply (2 of 8)



3. Disconnect one connector, and then release the wire harness from the guide.


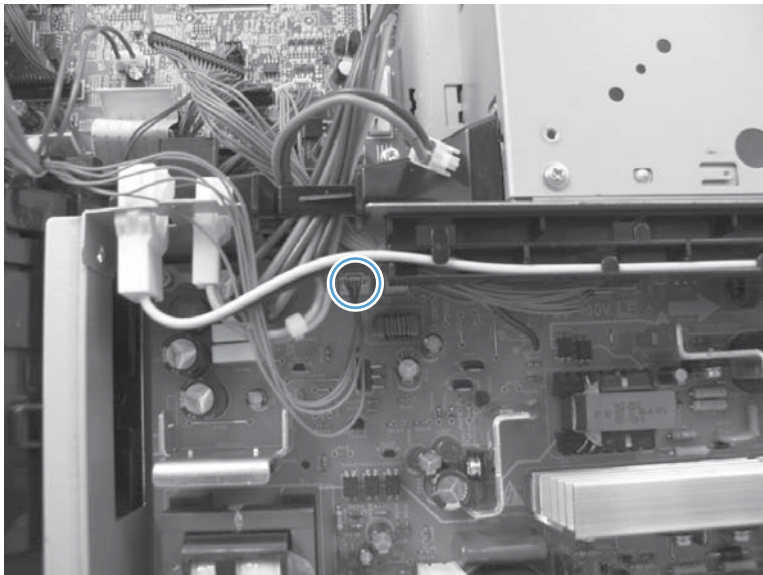
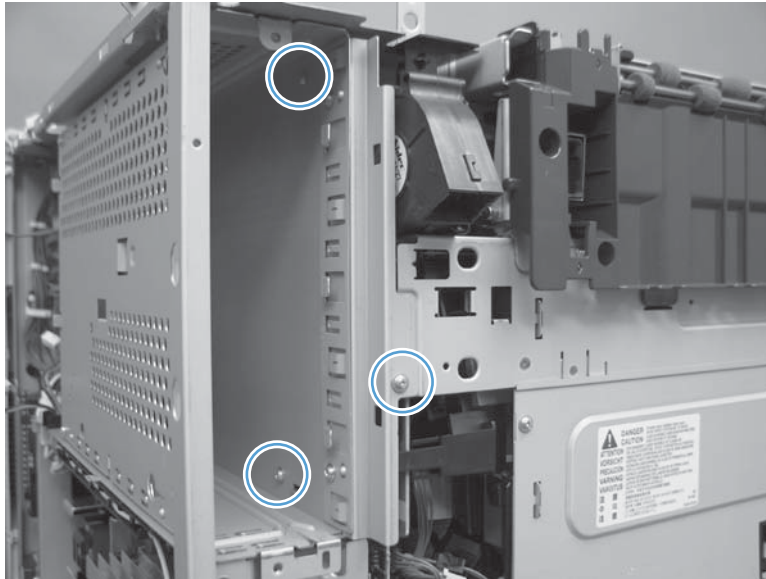
 **Reinstallation tip** Make sure that you reconnect this connector when the power supply is reinstalled.

Figure 2-212 Remove the low-voltage power supply (3 of 8)



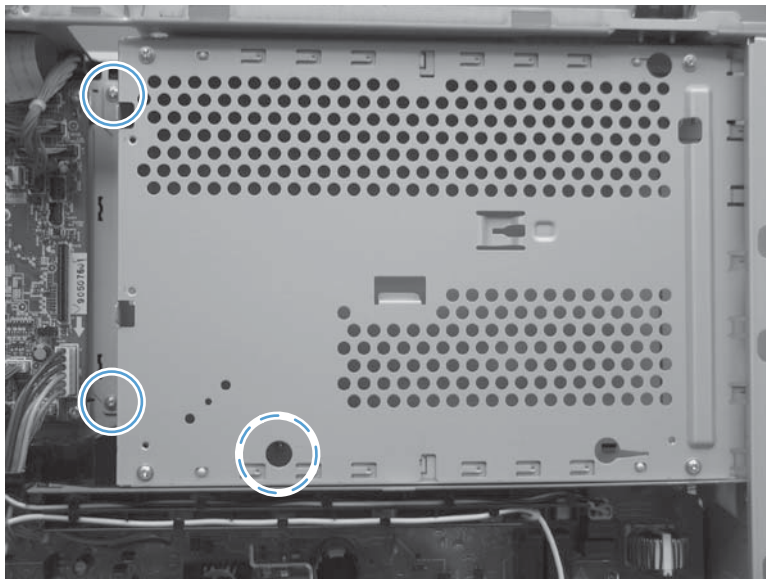
4. Remove three screws.

Figure 2-213 Remove the low-voltage power supply (4 of 8)



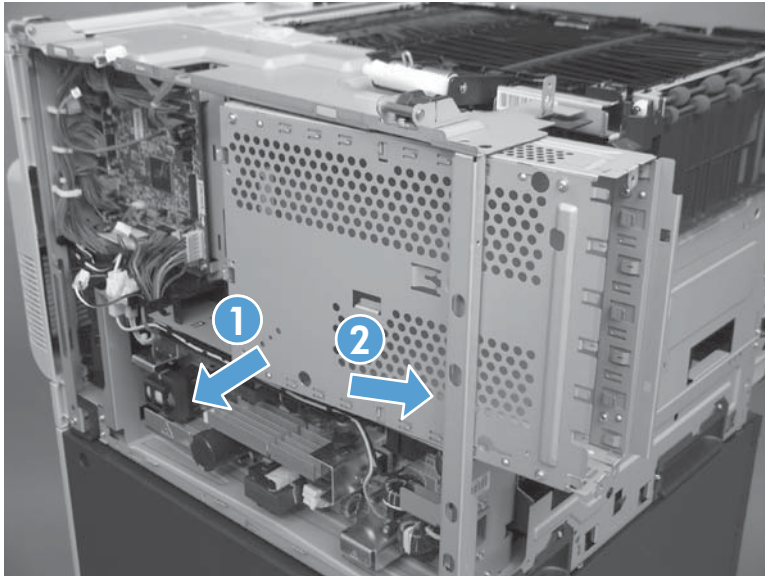
5. Remove three screws.

Figure 2-214 Remove the low-voltage power supply (5 of 8)



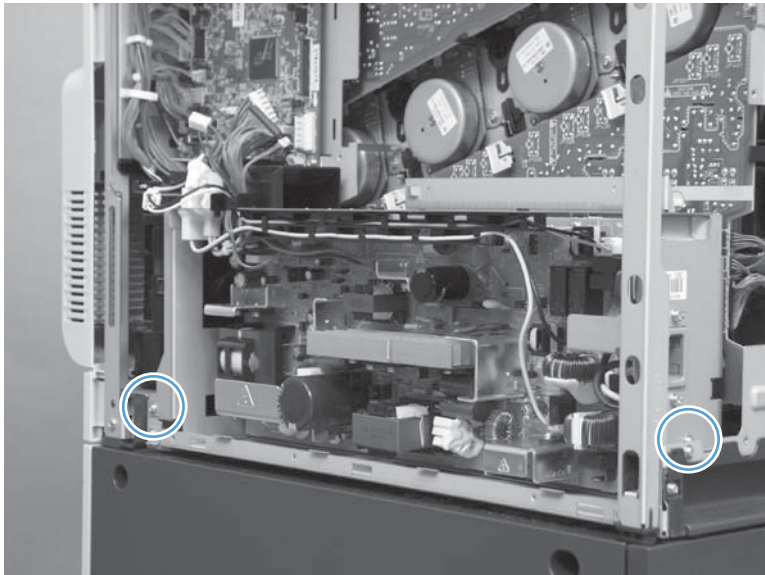
6. Slide the end of the formatter cage away from the product (callout 1) and then slide the cage out of the product (callout 2).

Figure 2-215 Remove the low-voltage power supply (6 of 8)



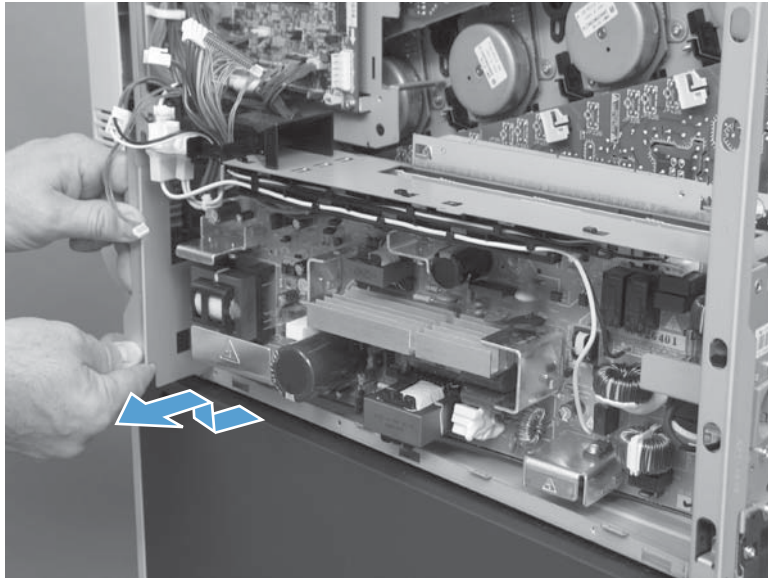
7. Remove two screws.

Figure 2-216 Remove the low-voltage power supply (7 of 8)



8. Slide and then lift the end of low-voltage power supply until it is free of the product. Remove the low-voltage power supply.

Figure 2-217 Remove the low-voltage power supply (8 of 8)



DC controller PCA and tray

Before proceeding, remove the following components:

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Fan cover. See [Fan cover on page 134](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply. See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).

Remove the DC controller PCA and tray

CAUTION:  ESD-sensitive part.

NOTE: To locate DC controller connector locations, see [DC controller connector locations on page 432](#).

1. Disconnect all the connectors. There are 34 connectors in all.


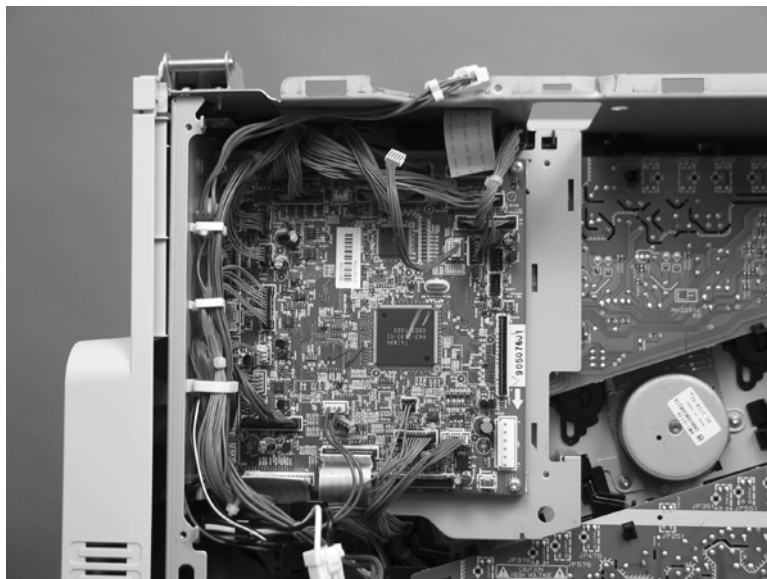
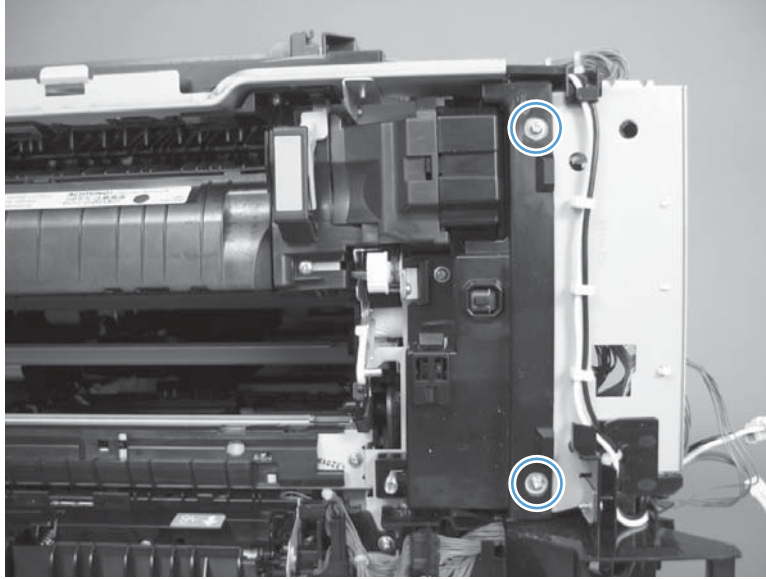
Reinstallation tip  The connector locations J101 and J102 are not used.

Figure 2-218 Remove the DC controller PCA and tray (1 of 3)



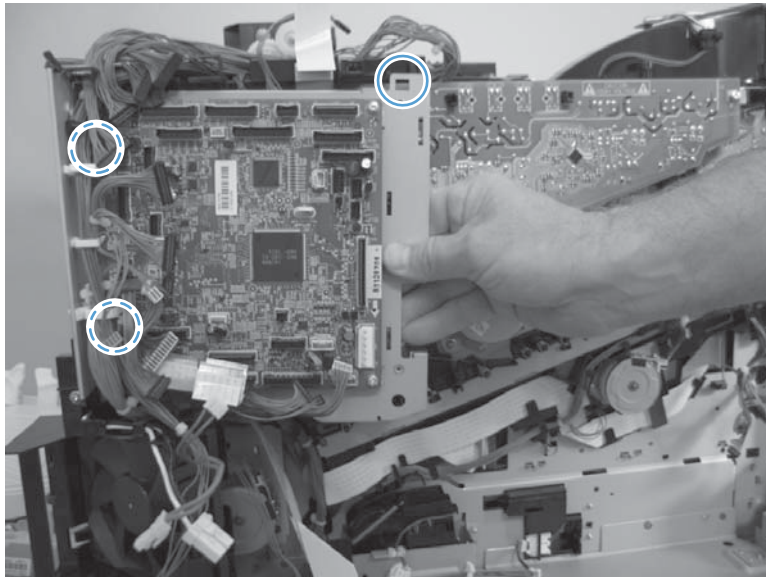
2. Remove two screws.

Figure 2-219 Remove the DC controller PCA and tray (2 of 3)



3. Disengage three tabs (two along the left edge of the PCA and one at the top-right corner of the PCA).

Figure 2-220 Remove the DC controller PCA and tray (3 of 3)



High-voltage power supply lower (HVPS-D)

Before proceeding, remove the following components:

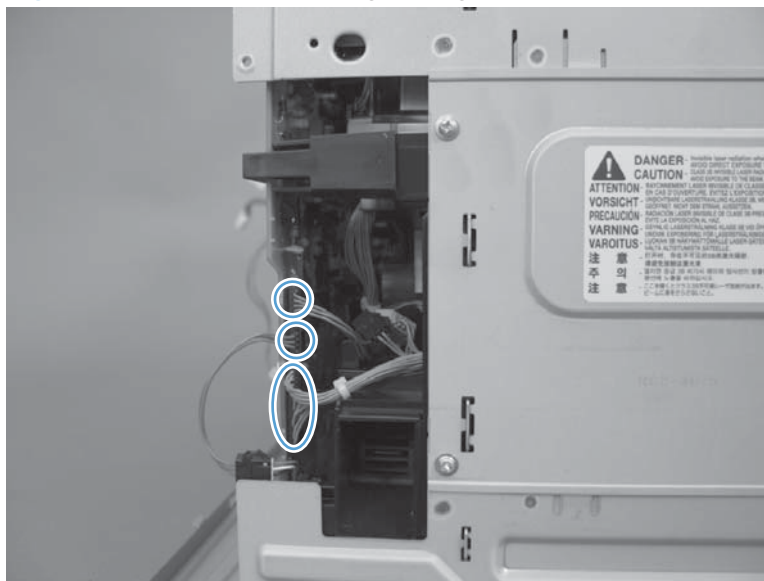
- Formatter. See [Formatter PCA on page 106](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply. See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).

Remove the high-voltage power supply lower

 **CAUTION:**  ESD-sensitive part.

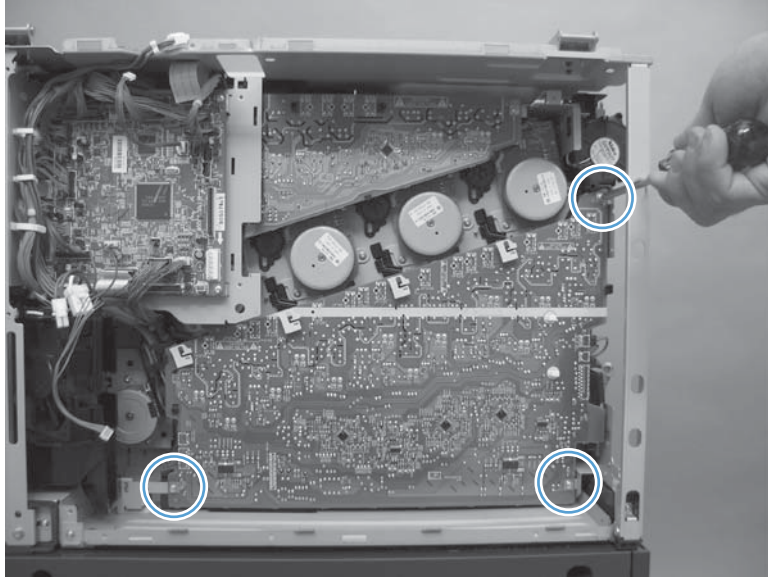
1. Disconnect three connectors.

Figure 2-221 Remove the high-voltage power supply lower (1 of 7)



2. Remove three screws.

Figure 2-222 Remove the high-voltage power supply lower (2 of 7)



3. Release four locking clips.

 **NOTE:** Squeeze each locking clip to remove.

Figure 2-223 Remove the high-voltage power supply lower (3 of 7)

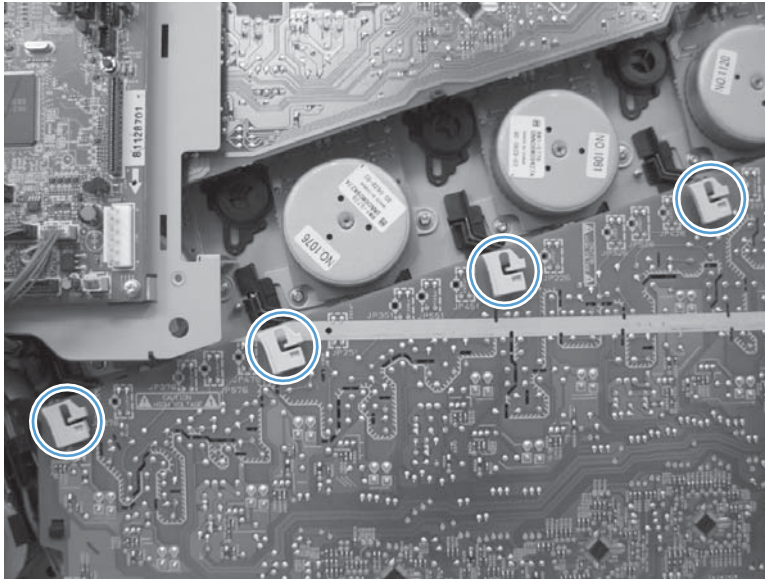
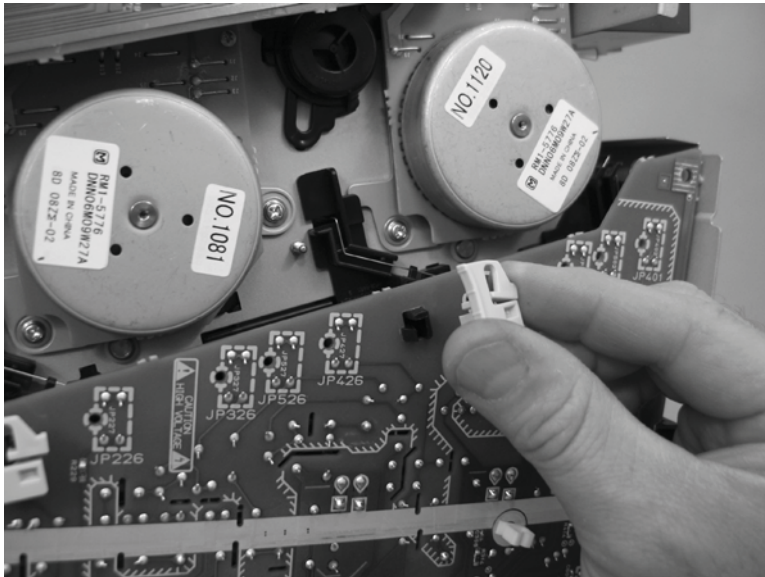
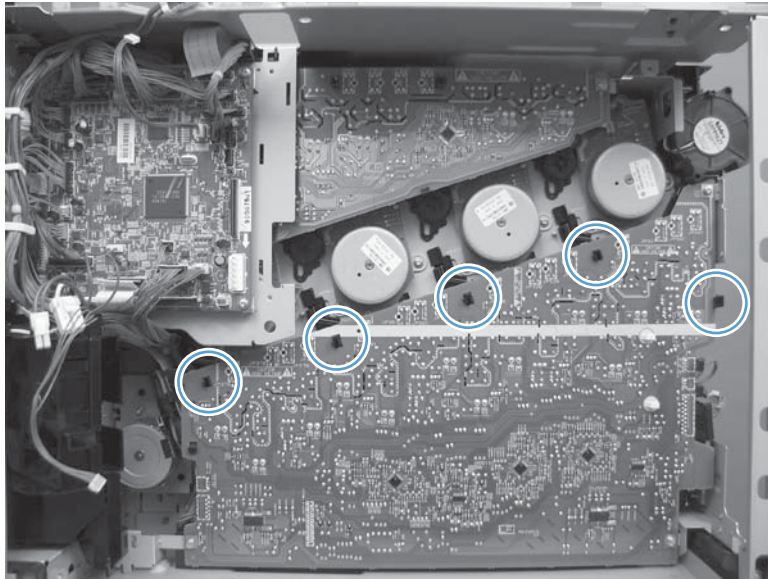


Figure 2-224 Remove the high-voltage power supply lower (4 of 7)



4. Release five tabs.

Figure 2-225 Remove the high-voltage power supply lower (5 of 7)

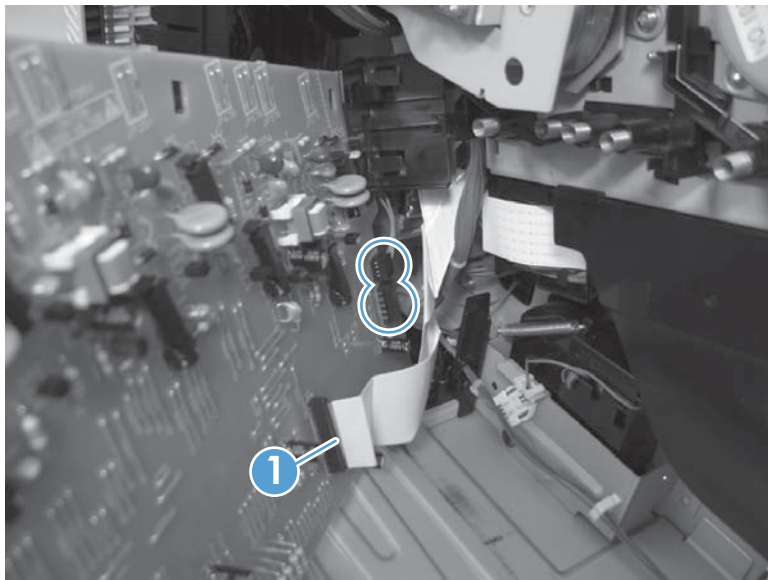


5. Rotate the top of the power supply away from the chassis, and then disconnect two connectors on the back of the power supply.



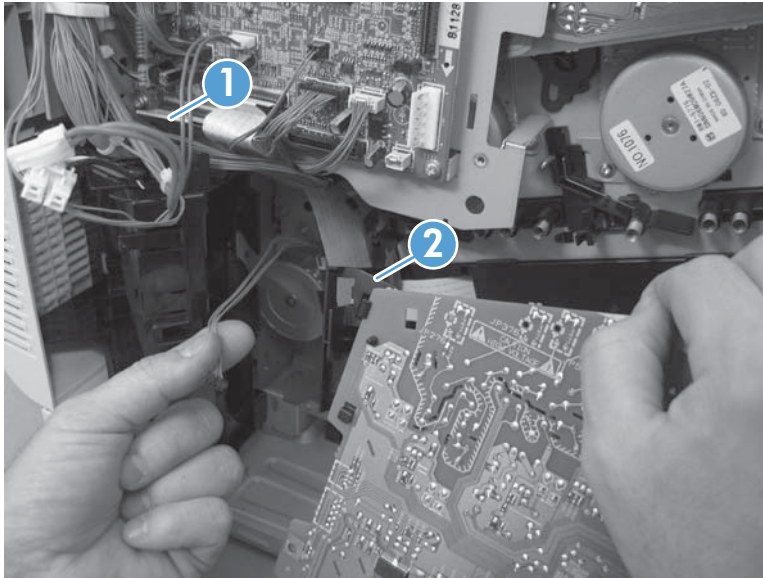
NOTE: Do not disconnect the FFC (callout 1). The FFC and the FFC wiring guide are supplied with the replacement assembly.

Figure 2-226 Remove the high-voltage power supply lower (6 of 7)



6. Disconnect one FFC (callout 1). Release **only** the wire harnesses from the guide (callout 2) and then remove the power supply.

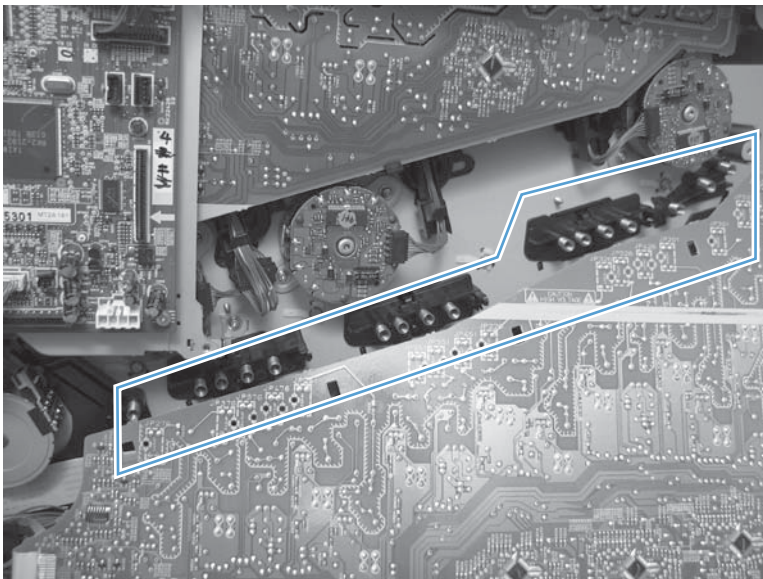
Figure 2-227 Remove the high-voltage power supply lower (7 of 7)



Reinstall the high-voltage power supply lower

When you reinstall the power supply, look through the holes in the PCA and make sure that the high-voltage contact springs are correctly seated against the PCA.

Figure 2-228 Reinstall the high-voltage power supply lower



Developing-disengagement motor

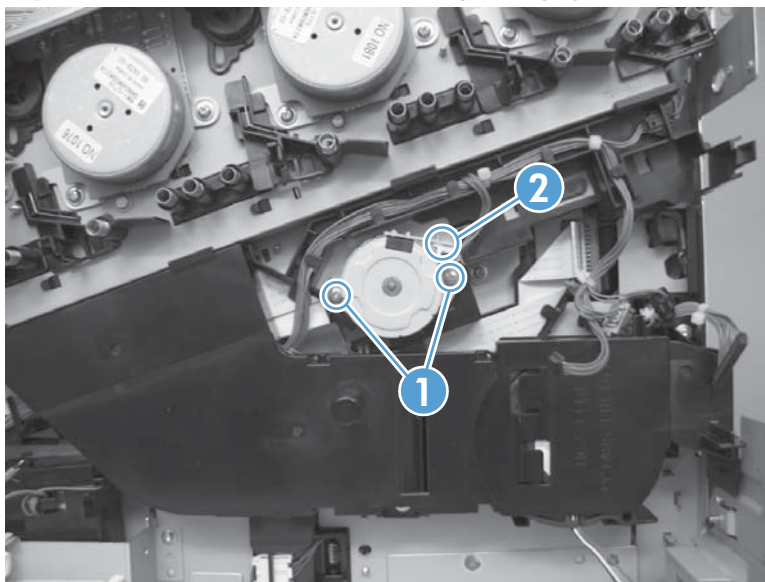
Before proceeding, remove the following components:

- Formatter. See [Formatter PCA on page 106](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply. See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- High-voltage power supply lower. See [High-voltage power supply lower \(HVPS-D\) on page 250](#).

Remove the developing-disengagement motor

- ▲ Remove two screws (callout 1), disconnect one connector (callout 2), and remove the motor.

Figure 2-229 Remove the developing-disengagement motor



Exhaust fan and fan duct

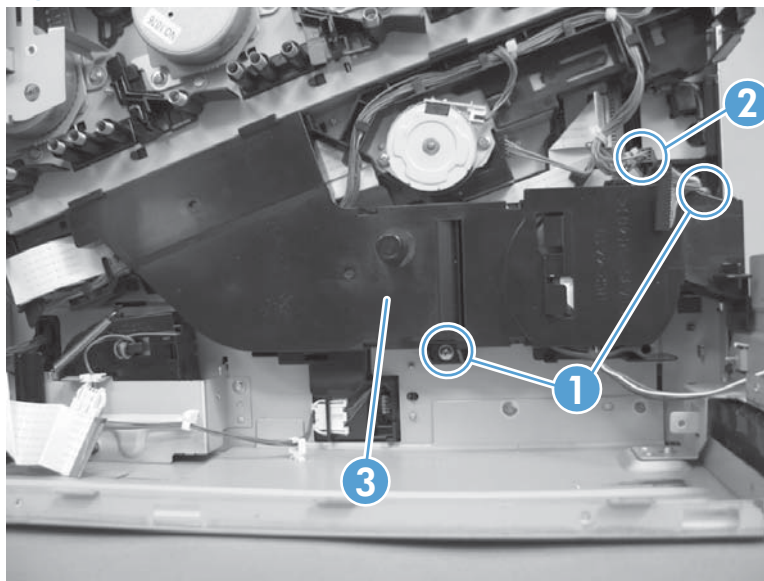
Before proceeding, remove the following components:

- Formatter. See [Formatter PCA on page 106](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply. See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- High-voltage power supply lower. See [High-voltage power supply lower \(HVPS-D\) on page 250](#).

Remove the exhaust fan and fan duct

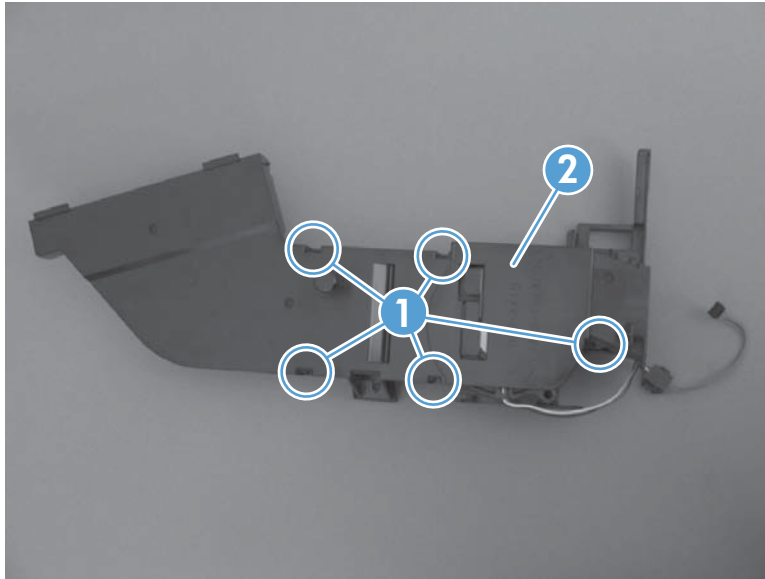
1. Remove two screws (callout 1), disconnect two connectors (callout 2), and then remove the exhaust fan and duct (callout 3) from the product.

Figure 2-230 Remove the exhaust fan and fan duct (1 of 3)



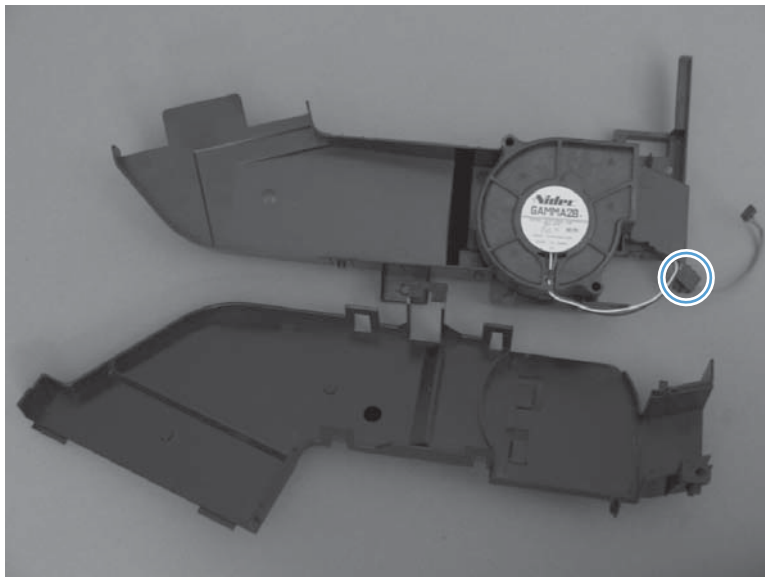
2. Release five tabs (callout 1) and remove the cover (callout 2).

Figure 2-231 Remove the exhaust fan and fan duct (2 of 3)



3. Disconnect one connector, and then remove the fan from the duct.

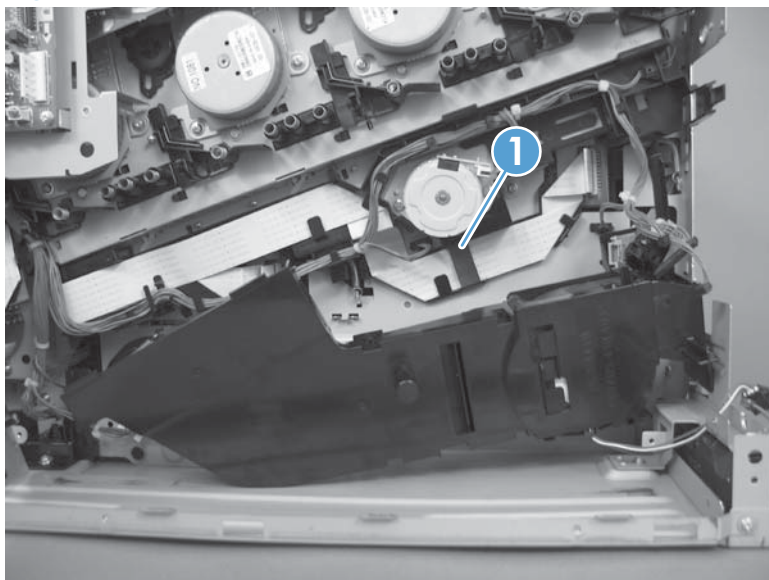
Figure 2-232 Remove the exhaust fan and fan duct (3 of 3)



Reinstall the exhaust fan and fan duct

Be sure that the toroid (callout 1) is correctly aligned in the FFC cable guide before attempting to reinstall the exhaust fan and duct.

Figure 2-233 Reinstall the exhaust fan and fan duct



Pickup motor

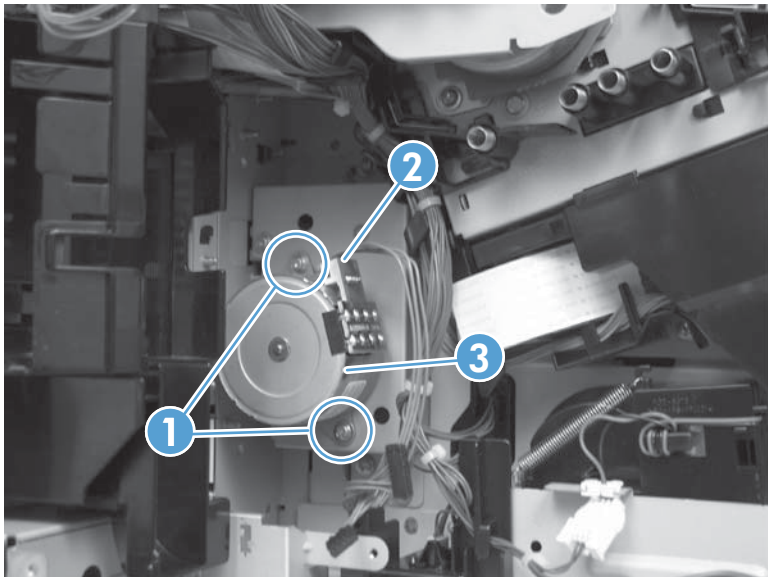
Before proceeding, remove the following components:

- Formatter. See [Formatter PCA on page 106](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply. See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).

Remove the pickup motor

Remove two screws (callout 1), disconnect one connector (callout 2), and then remove the motor (callout 3).

Figure 2-234 Remove the pickup motor



Lifter-drive assembly

Before proceeding, remove the following components:

- Formatter. See [Formatter PCA on page 106](#).
- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Fan cover. See [Fan cover on page 134](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- High-voltage power supply lower. See [High-voltage power supply lower \(HVPS-D\) on page 250](#).

Remove the lifter-drive assembly

1. Remove one screw (callout 1), and then move the accessory-tray connector (callout 2) to access the screw behind it.


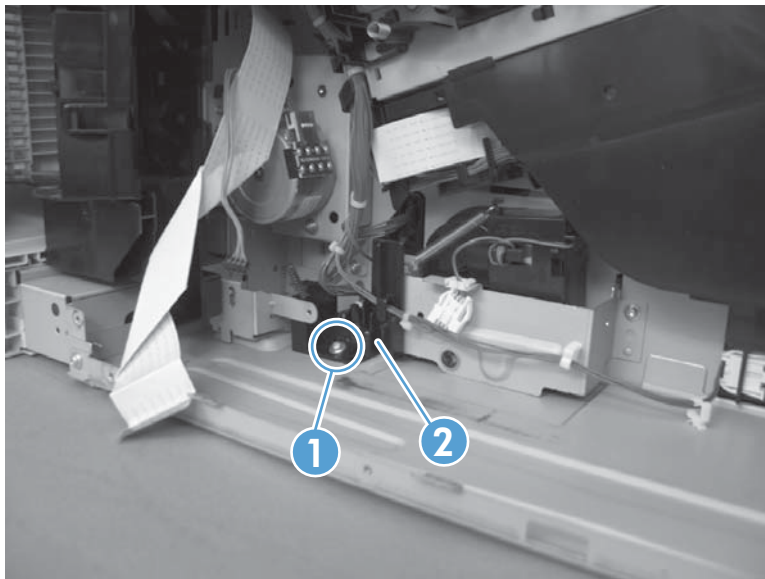
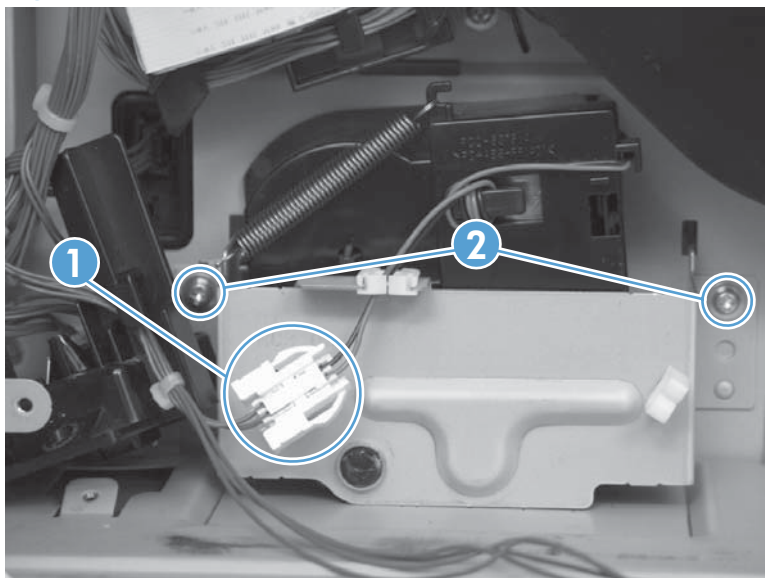
 **Reinstallation tip** If the product is installed on the optional paper feeder, you must slightly separate the product and the feeder assembly to install this connector. Open the right door on the feeder. Use the blue handle to release the product-accessory lock, and then lift up on the edge of the product to create a slight gap between the product and the accessory.

Figure 2-235 Remove the lifter-drive assembly (1 of 3)



2. Disconnect one connector (callout 1), and then remove two screws (callout 2).

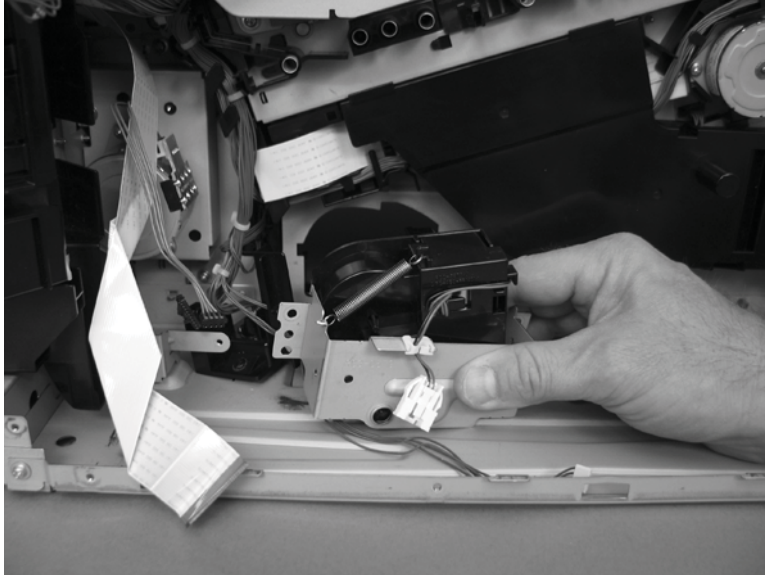
Figure 2-236 Remove the lifter-drive assembly (2 of 3)



3. Remove the lifter-drive assembly from the product.

CAUTION: The spring on the assembly is not captive. Do not lose the spring when the assembly is removed.

Figure 2-237 Remove the lifter-drive assembly (3 of 3)



NOTE: Make sure that the lifter-drive assembly moves up and down easily after reinstalling.

Lifter base assembly

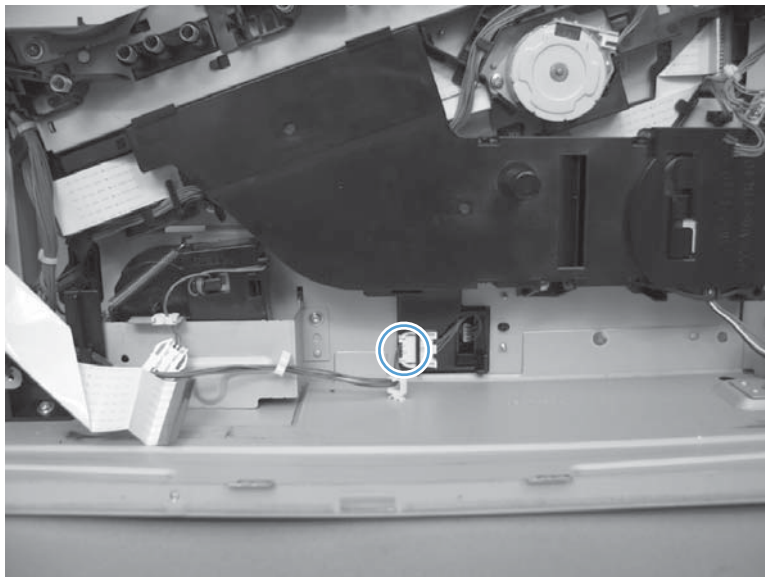
Before proceeding, remove the following components:

- Formatter. See [Formatter PCA on page 106](#)
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Fan cover. See [Fan cover on page 134](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- High-voltage power supply lower. See [High-voltage power supply lower \(HVPS-D\) on page 250](#).


Remove the lifter base assembly

1. Disconnect one connector.

Figure 2-238 Remove the lifter base assembly (1 of 2)



2. From inside the Tray 2 cavity, remove four screws, and then remove the lifter base assembly.

 **NOTE:** Pull the assembly straight from the product without tipping to prevent the spring from falling from the assembly.


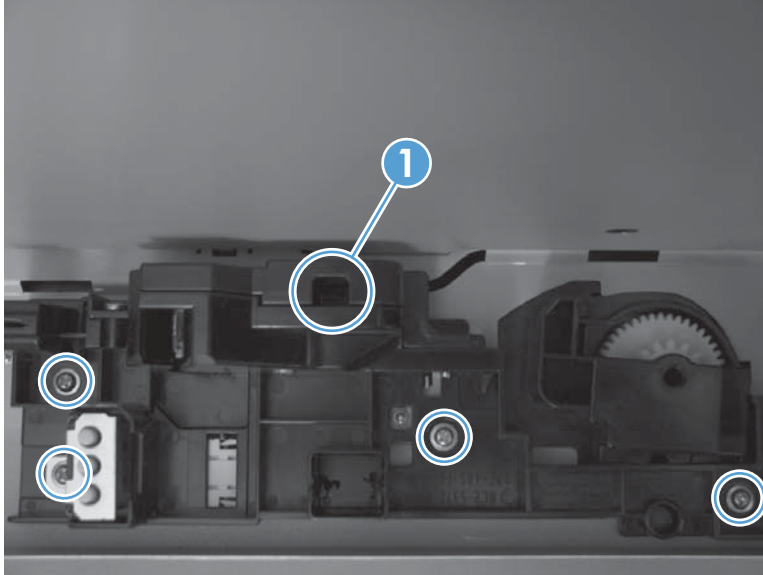
 **Reinstallation tip** If the tray does not completely close when reinstalled, push on the lever in the opening (callout 1) with a flat blade screwdriver to reset the spring in the closing mechanism.

Figure 2-239 Remove the lifter base assembly (2 of 2)



Reinstall the lifter base assembly

If the spring falls from the lifter base assembly, reinstall it in the lifter before reinstalling the lifter base assembly.

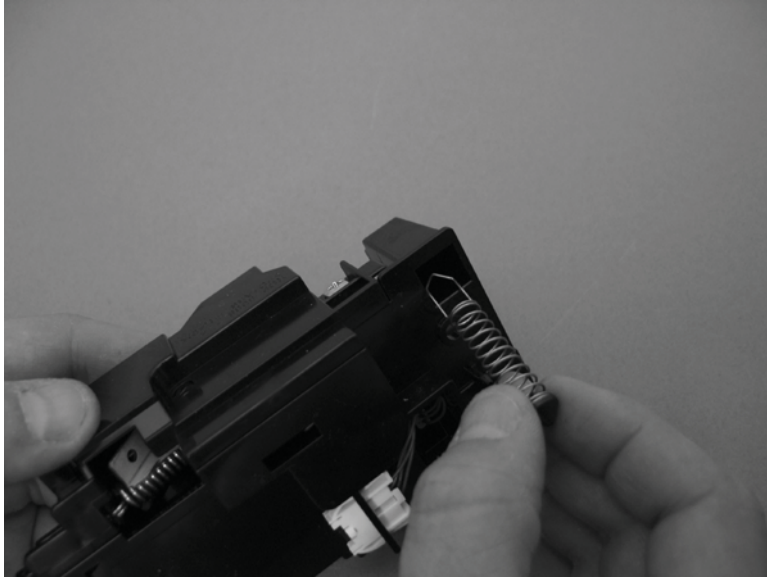
1. Make sure the black rubber end is seated on the spring.

Figure 2-240 Reinstall the lifter base assembly (1 of 2)



2. Place the spring in the lifter before installing the assembly on the product.

Figure 2-241 Reinstall the lifter base assembly (2 of 2)



Tray-pickup drive assembly

Before proceeding, remove the following components:

- Formatter. See [Formatter PCA on page 106](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Rear cover. See [Rear cover on page 144](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Power-supply fan. See [Power-supply fan on page 236](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- High-voltage power supply lower. See [High-voltage power supply lower \(HVPS-D\) on page 250](#).

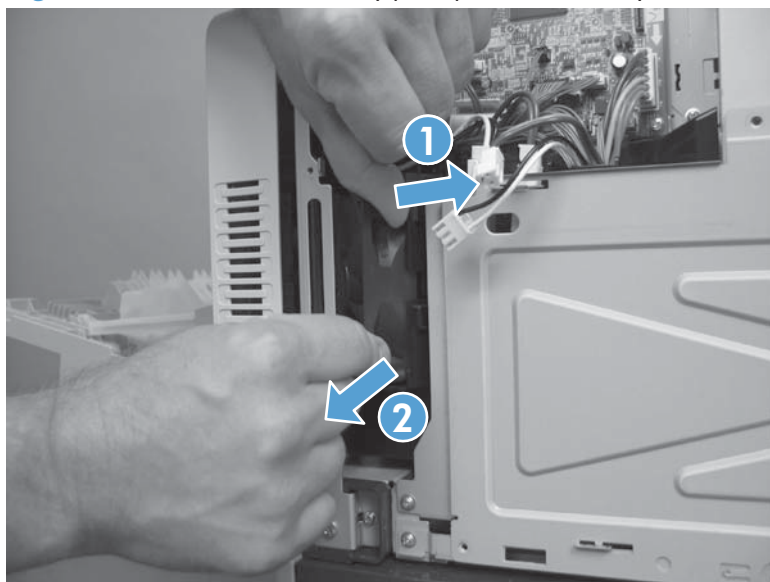
Remove the tray-pickup drive assembly



NOTE: To remove the pickup motor only, see [Pickup motor on page 259](#).

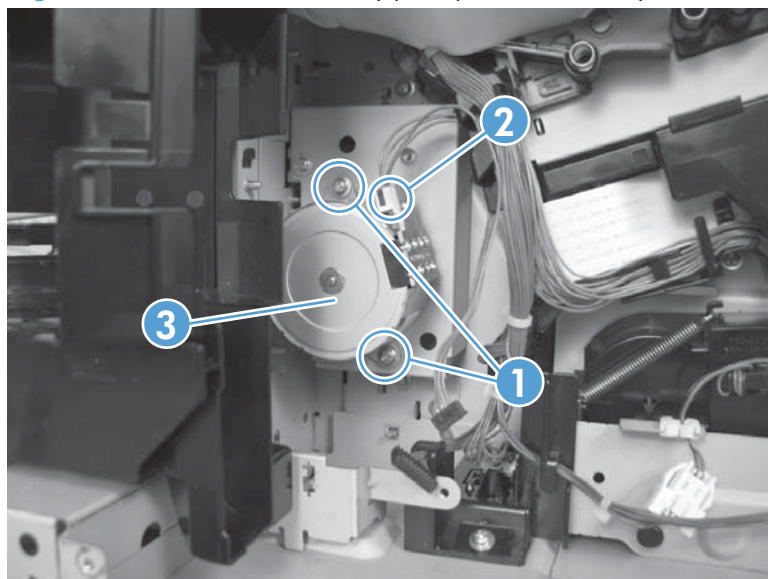
1. Release one tab (callout 1), and then remove the power-supply fan (callout 2).

Figure 2-242 Remove the tray-pickup drive assembly (1 of 3)



2. Remove two screws (callout 1), disconnect one connector (callout 2), and then remove the pickup motor (callout 35).

Figure 2-243 Remove the tray-pickup drive assembly (2 of 3)

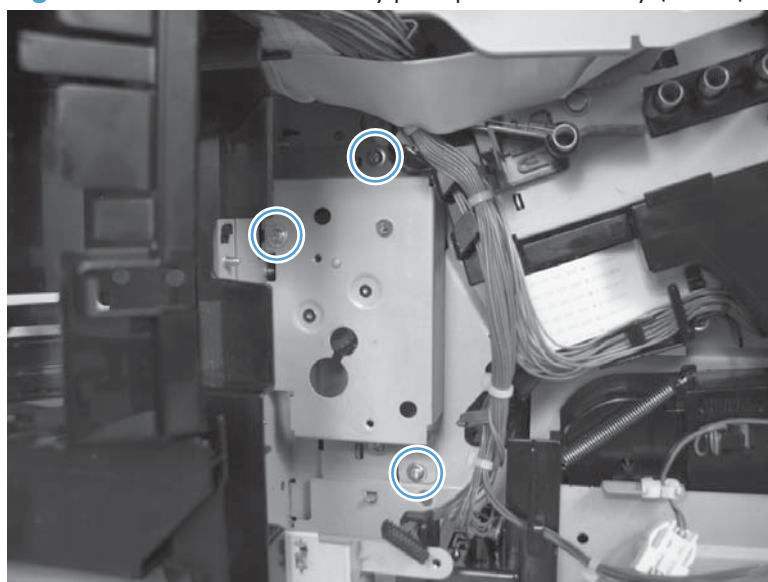


3. Remove three screws, and then remove the tray-pickup drive assembly.



NOTE: The cams on the main-drive assembly can prevent the tray-pickup drive assembly from releasing from the product. If you cannot remove the assembly, remove the DC controller and tray to provide additional space. See [DC controller PCA and tray on page 248](#). You might also need to remove the wire guide from the main-drive assembly. See [Figure 2-280 Remove the main-drive assembly \(4 of 7\) on page 295](#).

Figure 2-244 Remove the tray-pickup drive assembly (3 of 3)




Tray-pickup assembly

Before proceeding, remove the following components:

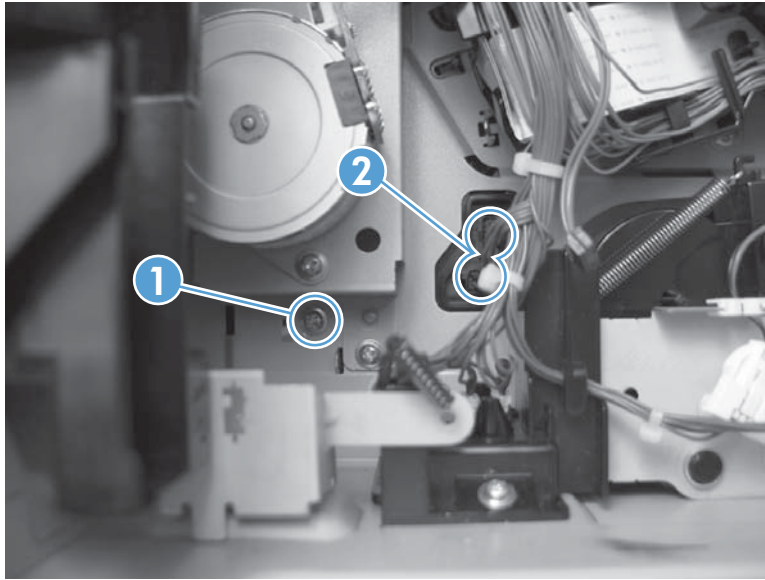
- Formatter. See [Formatter PCA on page 106](#).
- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Right-rear cover. See [Right-rear cover on page 143](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Secondary transfer assembly. See [Secondary transfer assembly on page 204](#).
- Registration assembly. See [Registration assembly on page 213](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- High-voltage power supply lower. See [High-voltage power supply lower \(HVPS-D\) on page 250](#).

Remove the tray-pickup assembly

 **NOTE:** This task requires that you remove three feed guides on the right side of the product before you can remove the tray-pickup assembly.

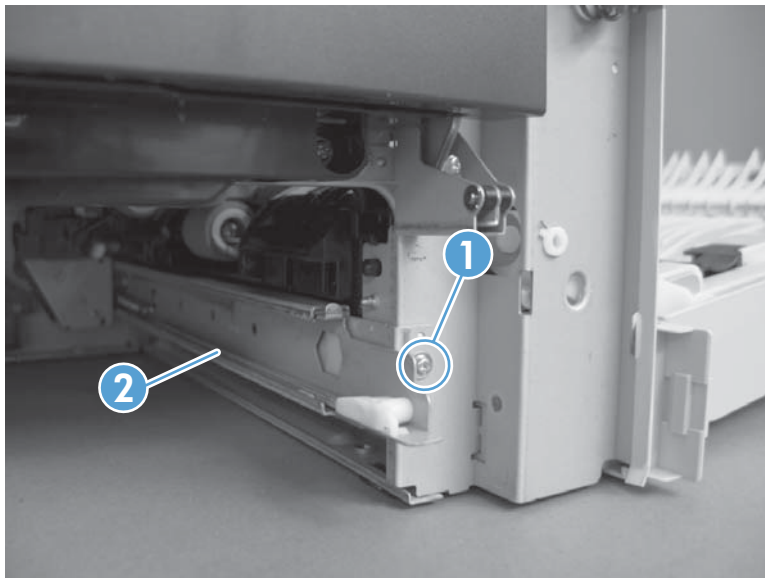
1. Remove one screw (callout 1), and then disconnect two connectors (callout 2).

Figure 2-245 Remove the tray-pickup assembly (1 of 11)



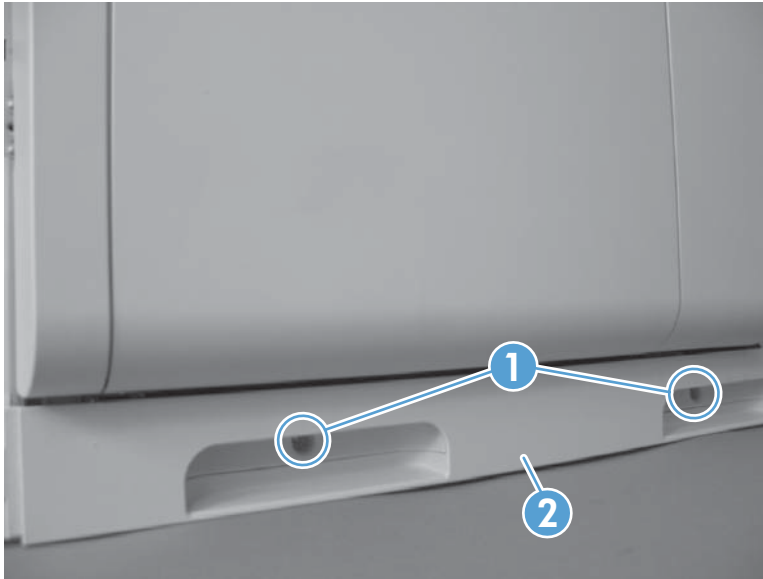
2. From the front of the product, remove one screw (callout 1), and then remove one tray rail (callout 2).

Figure 2-246 Remove the tray-pickup assembly (2 of 11)



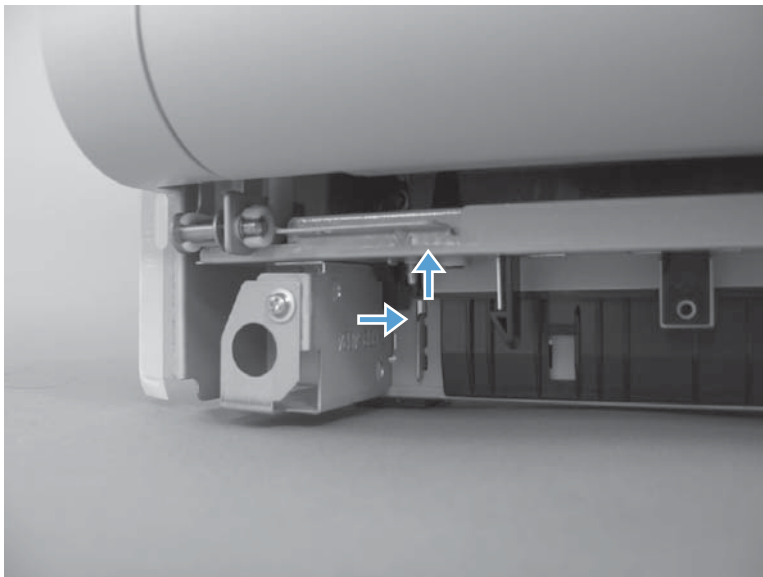
3. From the right side of the product, remove two screws (callout 1) and one cover (callout 2).

Figure 2-247 Remove the tray-pickup assembly (3 of 11)



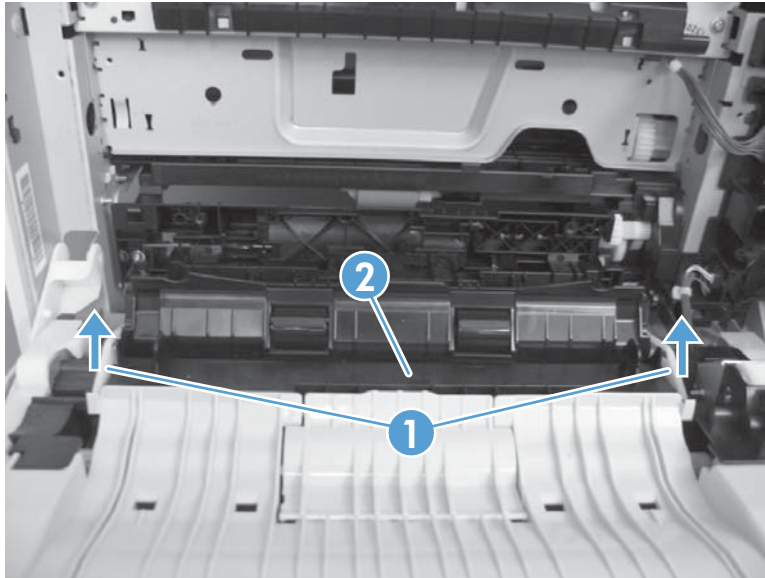
4. Close the right-door assembly. Push in and then push up on the stopper to release.

Figure 2-248 Remove the tray-pickup assembly (4 of 11)



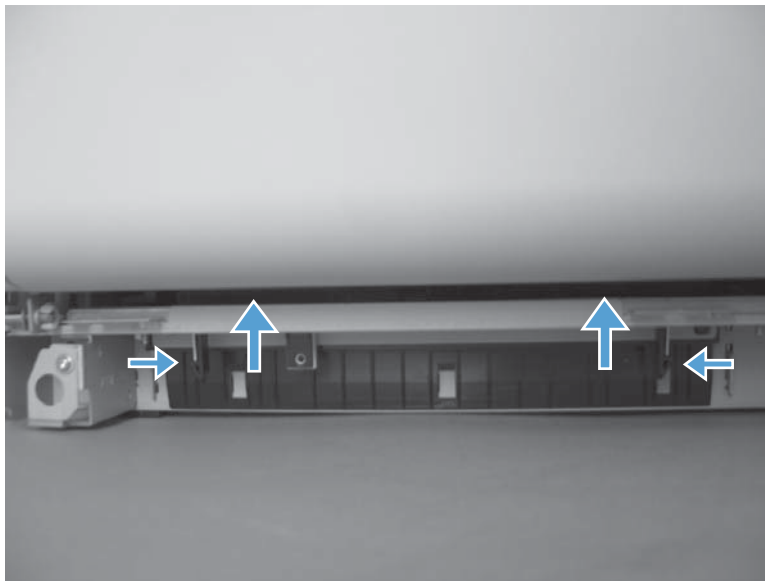
5. Open the right-door assembly. Lift the two link arms (callout 1) to release from the product, and then remove the paper guide (callout 2).

Figure 2-249 Remove the tray-pickup assembly (5 of 11)



6. Close the right-door assembly. Push the two tabs toward each other, and then push up to release the feed guide.

Figure 2-250 Remove the tray-pickup assembly (6 of 11)



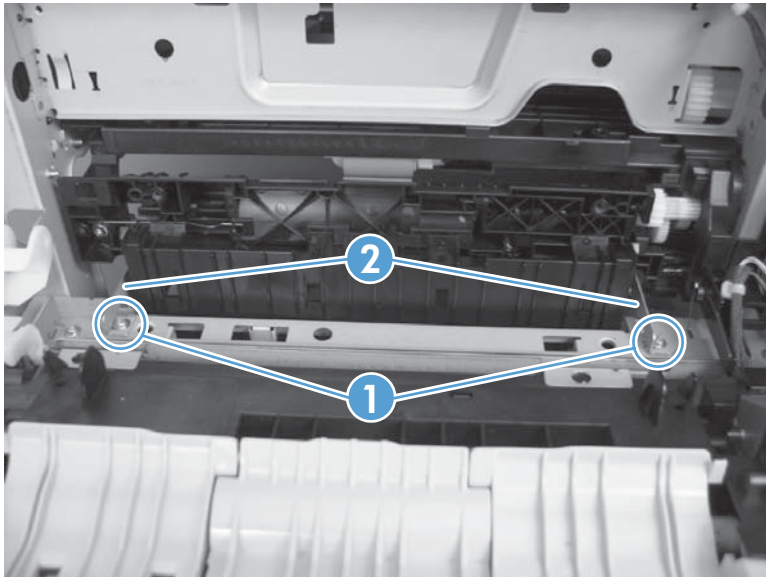
7. Open the right-door assembly, and then remove the feed guide.

Figure 2-251 Remove the tray-pickup assembly (7 of 11)



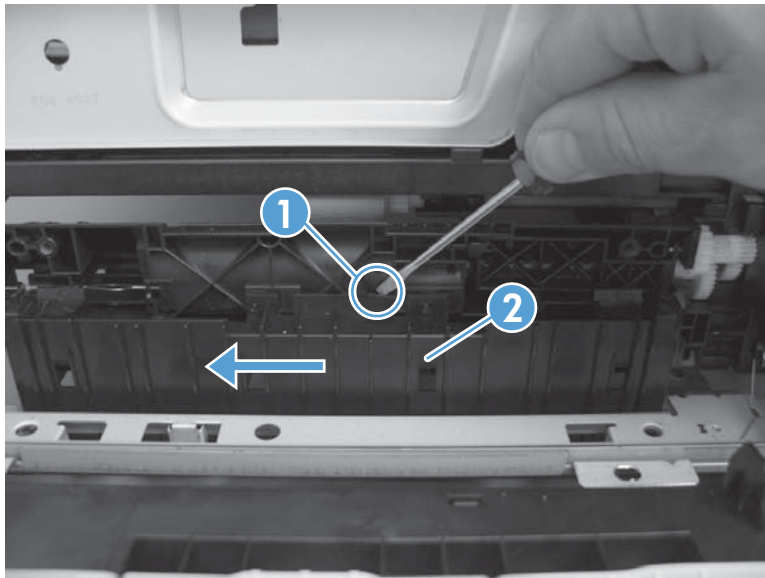
8. Remove two screws (callout 1), and then remove two brackets (callout 2).

Figure 2-252 Remove the tray-pickup assembly (8 of 11)



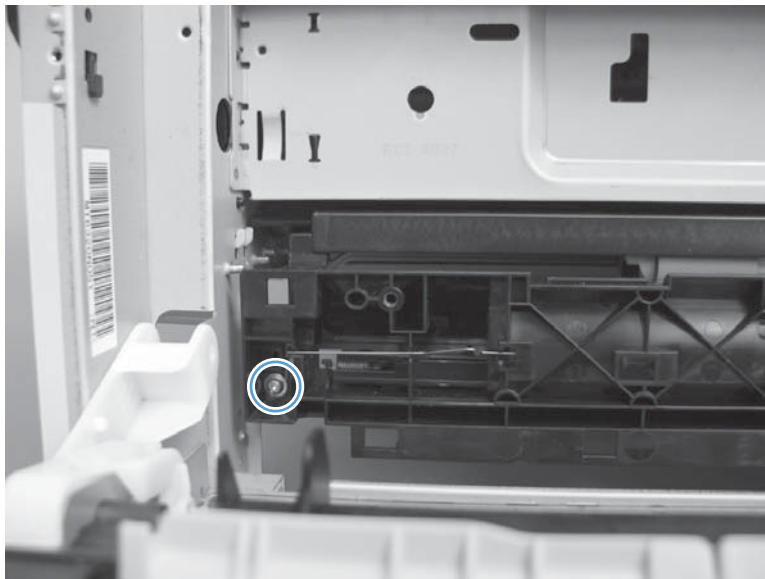
9. Release one tab (callout 1), and then slide the feed guide (callout 2) toward the front of the product to remove.

Figure 2-253 Remove the tray-pickup assembly (9 of 11)



10. Remove one screw.

Figure 2-254 Remove the tray-pickup assembly (10 of 11)



11. Remove the tray-pickup assembly.

Figure 2-255 Remove the tray-pickup assembly (11 of 11)




Laser/scanner assembly (Y/M)

Before proceeding, remove the following components:

- Toner collection unit. See [Toner-collection unit on page 104](#).
- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Cartridge fan and environmental sensor. See [Cartridge fan and environmental sensor on page 222](#).
- Toner collection sensor and scanner-thermistor assembly. See [Toner-collection sensor and scanner-thermistor assembly on page 226](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- High-voltage power supply lower. See [High-voltage power supply lower \(HVPS-D\) on page 250](#).
- Exhaust fan and fan duct. See [Exhaust fan and fan duct on page 256](#).

Remove the laser/scanner assembly (Y/M)

 **NOTE:** After installing a new laser/scanner assembly, be sure to calibrate the product. See [Calibrate the product on page 468](#).

1. Release one spring.


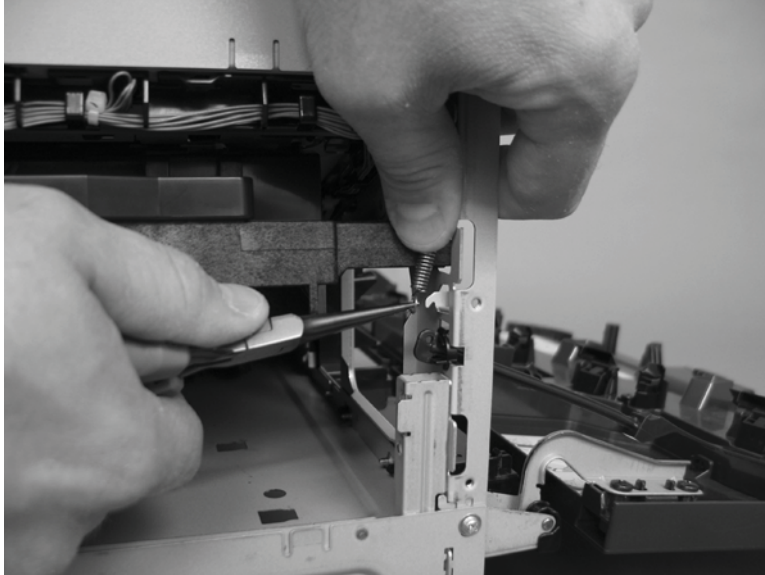
 **CAUTION:** The spring is not captive. Do not lose the spring when it is removed. Use a pair of needle-nose pliers to safely retain the spring when it is removed. Do not use a flat blade screwdriver to remove the spring; the spring could forcibly leave the product and strike you.

Figure 2-256 Remove the laser/scanner assembly (Y/M) (1 of 5)



2. Disconnect one connector.

Figure 2-257 Remove the laser/scanner assembly (Y/M) (2 of 5)



3. Release one spring (callout 1), and then disconnect one FFC (callout 2).


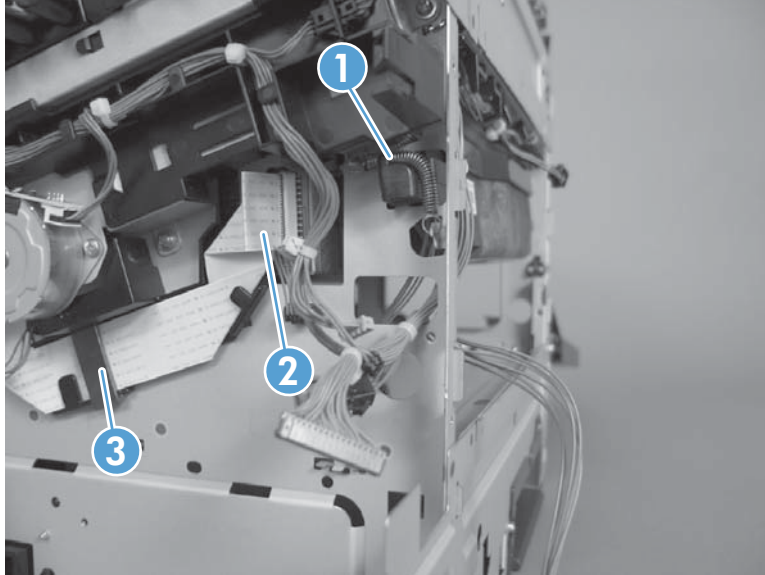


 **Reinstallation tip** When reinstalled, the toroid (callout 3) must be correctly positioned on the wire guide (in the provided slots) so that the fan duct will fully seat in the product when it is reinstalled.

Figure 2-258 Remove the laser/scanner assembly (Y/M) (3 of 5)



 **CAUTION:** The spring is not captive. Do not lose the spring when it is removed. Use a pair of needle-nose pliers to safely retain the spring when it is removed. Do not use a flat blade screwdriver to remove the spring; the spring could forcibly leave the product and strike you.

 **Reinstallation tip** When you reinstall the spring, make sure that the laser/scanner fits tightly up against the product chassis, and make sure that the FFC is fully seated in the connector. The locator tabs on the front and rear of the scanner must be firmly seated in the slots in the chassis.

4. Rotate the front of the laser/scanner assembly down (callout 1), and then slide it toward the right (callout 2). Lower the left corner, and then rotate the left corner out of the product (callout 3).


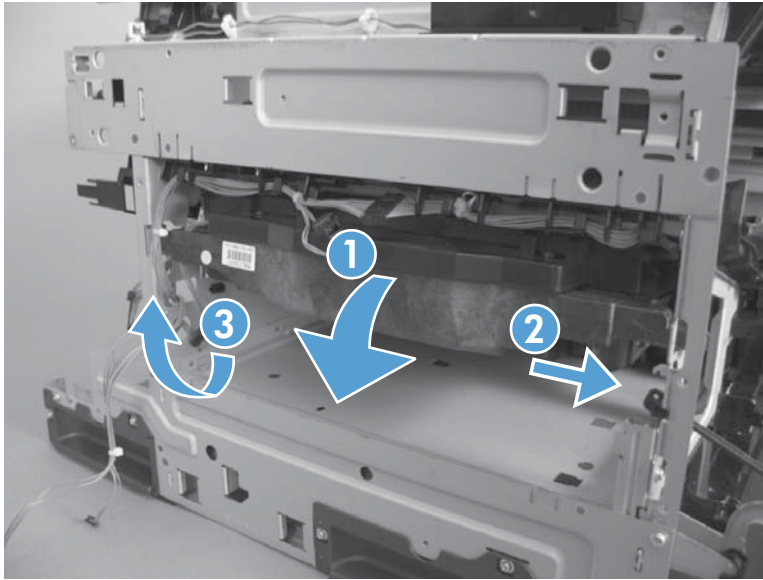
 **Reinstallation tip** When the scanner is reinstalled, make sure that the tab on the front of the laser/scanner is inserted in the alignment hole in the product chassis. See callout 1 in [Figure 2-260 Remove the laser/scanner assembly \(Y/M\) \(5 of 5\) on page 278](#)

Figure 2-259 Remove the laser/scanner assembly (Y/M) (4 of 5).



5. Pull the laser/scanner assembly out of the product to remove it.


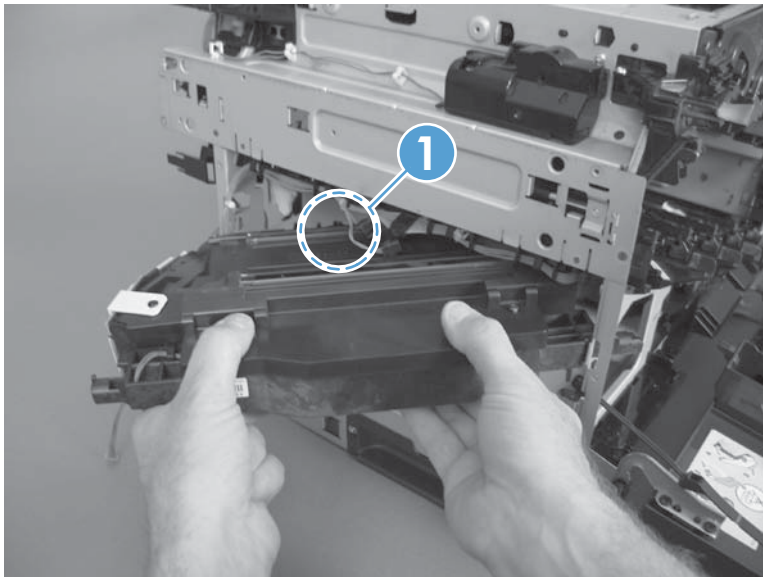
 **Reinstallation tip** When the scanner is removed, locate the alignment tab (callout 1) on the front of the laser/scanner. The tab must be inserted in the alignment hole in the product chassis when the assembly is reinstalled.

Figure 2-260 Remove the laser/scanner assembly (Y/M) (5 of 5)




Laser/scanner assembly (C/Bk)


Before proceeding, remove the following components:

- Toner collection unit. See [Toner-collection unit on page 104](#).
- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Document feeder. See [Document feeder on page 151](#).
- Rear cover. See [Rear cover on page 144](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Cartridge fan and environmental sensor. See [Cartridge fan and environmental sensor on page 222](#).
- Toner collection sensor and scanner-thermistor assembly. See [Toner-collection sensor and scanner-thermistor assembly on page 226](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- High-voltage power supply lower. See [High-voltage power supply lower \(HVPS-D\) on page 250](#).
- Exhaust fan and fan duct. See [Exhaust fan and fan duct on page 256](#).
- Laser/scanner assembly (Y/M). See [Laser/scanner assembly \(Y/M\) on page 275](#).

Remove the laser/scanner assembly (C/Bk)

 **NOTE:** After installing a new laser/scanner assembly, be sure to calibrate the product. See [Calibrate the product on page 468](#).

1. Release one spring (callout 1), and then disconnect one FFC (callout 2).

 **CAUTION:** The spring is not captive. Do not lose the spring when it is removed. Use a pair of needle-nose pliers to safely retain the spring when it is removed. Do not use a flat blade screwdriver to remove the spring; the spring could forcibly leave the product and strike you.


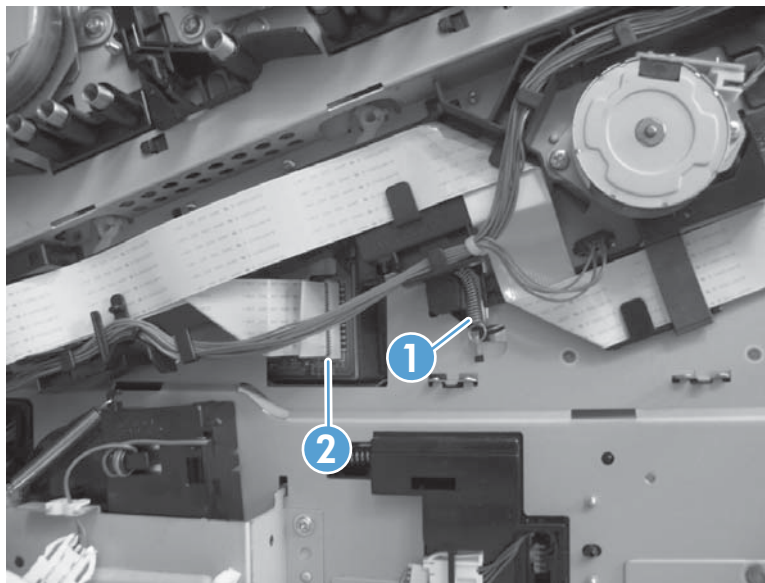
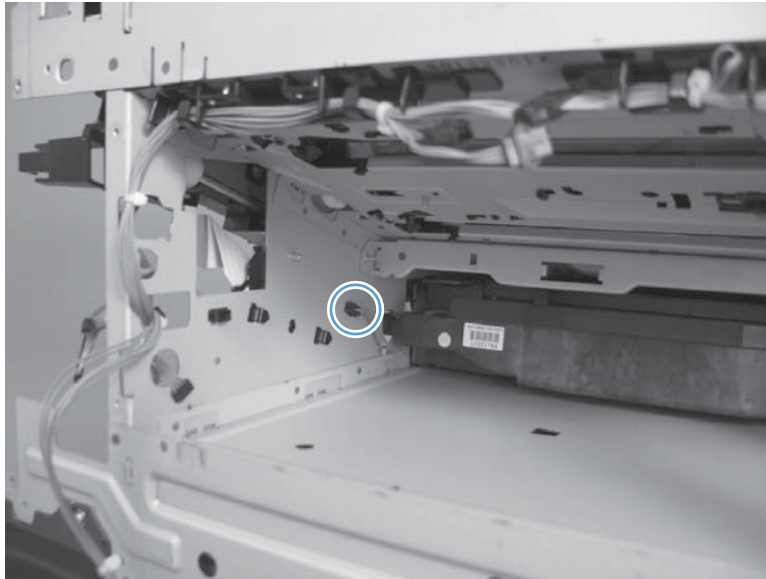
 **Reinstallation tip** When you reinstall the spring, make sure that the laser/scanner fits tightly up against the product chassis, and make sure that the FFC is fully seated in the connector. The locator tabs on the front of the scanner must be firmly seated in the slots in the chassis.

Figure 2-261 Remove the laser/scanner assembly (C/Bk) (1 of 5)



2. Disconnect one connector.

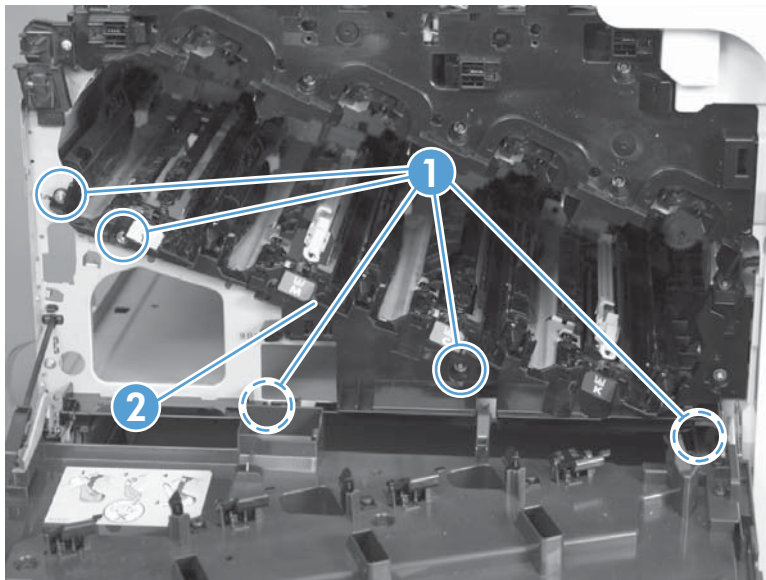
Figure 2-262 Remove the laser/scanner assembly (C/Bk) (2 of 5)



3. Remove five screws (callout 1), and then remove the cover (callout 2).

CAUTION: Be careful. The PGC actuators are easily dislodged when the cover is removed. See [Figure 2-266 Reinstall the PGC actuators \(1 of 5\) on page 283](#). To reinstall the actuators, see [Reinstall the protective glass cleaner \(PGC\) actuators on page 283](#).

Figure 2-263 Remove the laser/scanner assembly (C/Bk) (3 of 5)

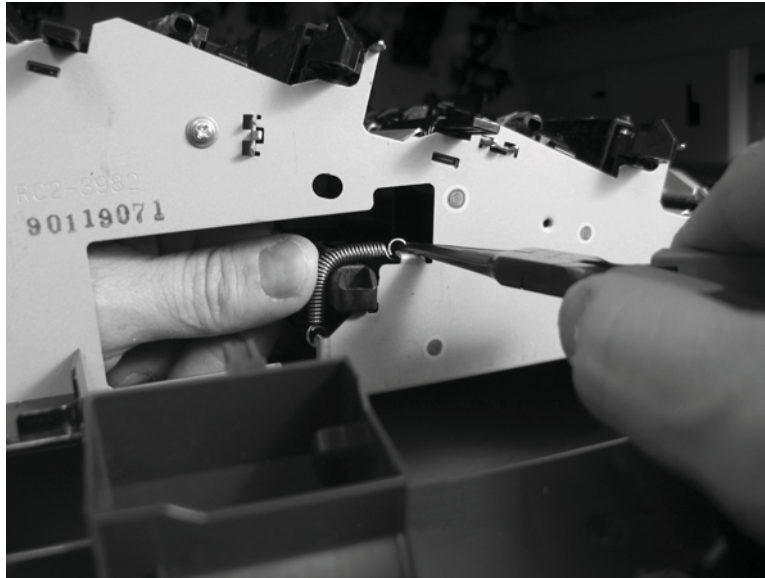


4. Release one spring.

⚠ CAUTION: The spring is not captive. Do not lose the spring when it is removed. Use a pair of needle-nose pliers to safely retain the spring when it is removed. Do not use a flat blade screwdriver to remove the spring; the spring could forcibly leave the product and strike you.

💡 Reinstallation tip When you reinstall the spring, make sure that the laser/scanner fits tightly up against the product chassis.

Figure 2-264 Remove the laser/scanner assembly (C/Bk) (4 of 5)



5. Rotate the corner of the assembly away from the product until you can see the PCA, and then remove the assembly from the product.


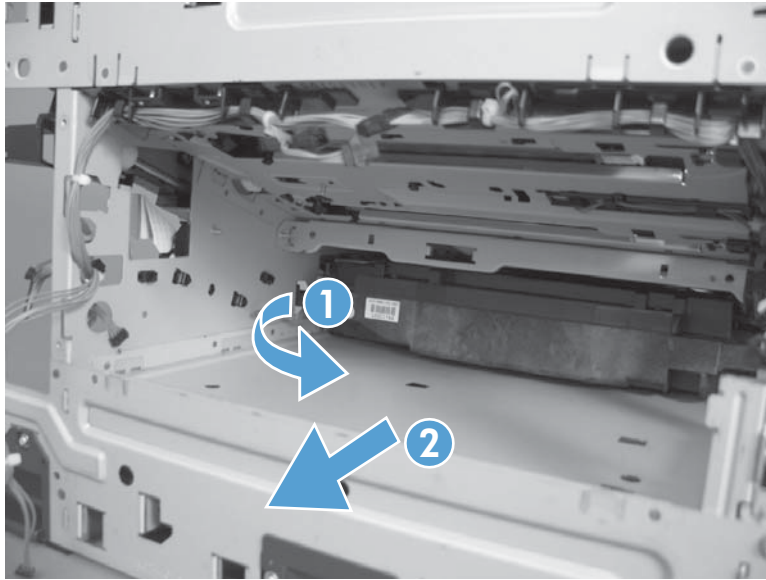
 **Reinstallation tip** When the laser/scanner is correctly positioned in the chassis, the plastic parts which protrude at the front and rear of the product will be firmly seated against the locator tabs on the chassis. Verify that the assembly is correctly seated, and then install the spring.

Figure 2-265 Remove the laser/scanner assembly (C/Bk) (5 of 5)



Reinstall the protective glass cleaner (PGC) actuators

1. The following figure shows a dislodged PGC actuator.


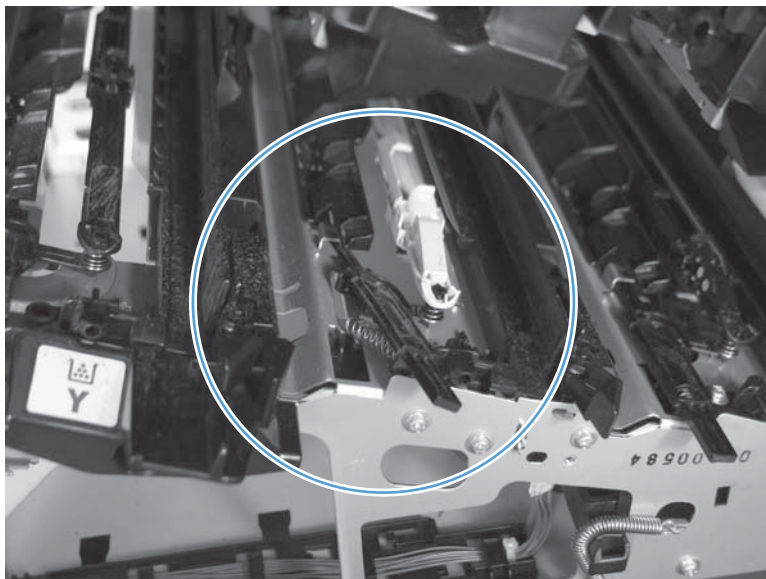
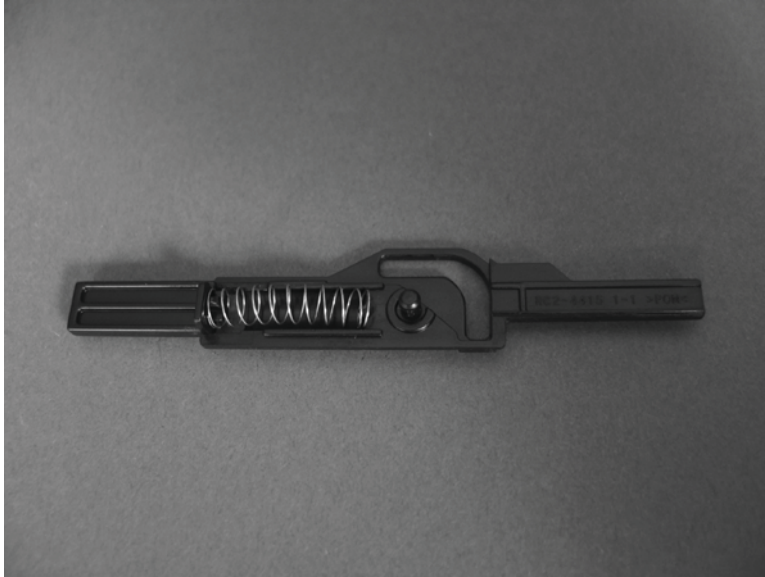
 **TIP:** If the actuator and spring are only slightly dislodged, you might be able to easily push them back into place.

Figure 2-266 Reinstall the PGC actuators (1 of 5)



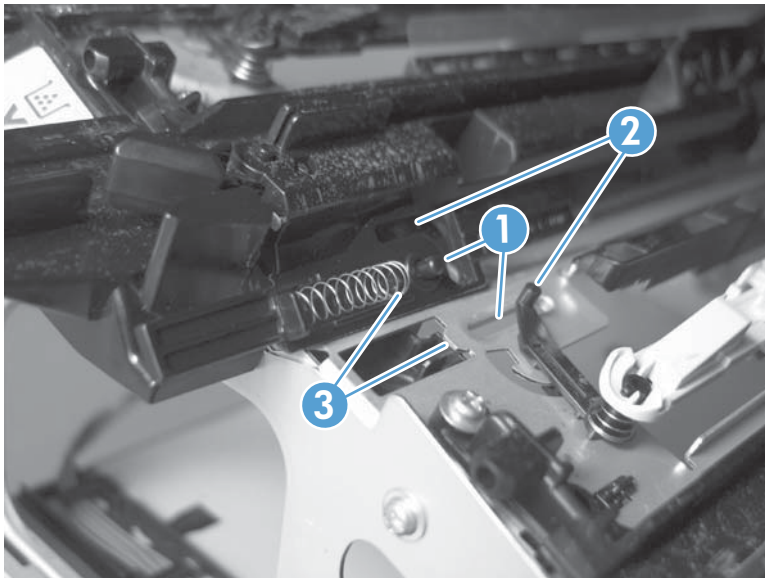
2. Remove the actuator and spring from the product. Install the spring on the actuator.

Figure 2-267 Reinstall the PGC actuators (2 of 5)



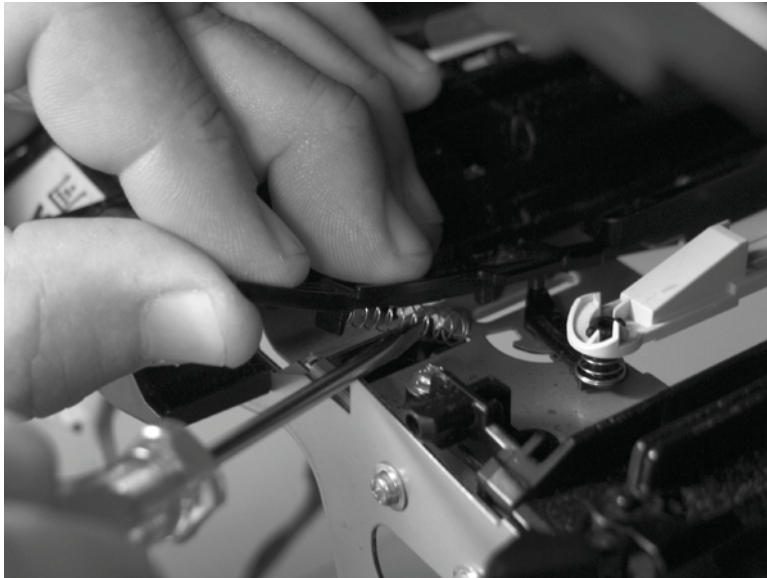
3. Before proceeding, take note of the following:
 - **Callout 1:** The pin on the actuator will be installed into the slot in the chassis.
 - **Callout 2:** The pin on the pivot arm will be installed into the slot on the actuator.
 - **Callout 3:** The end of the spring will be installed onto the tab on the chassis.

Figure 2-268 Reinstall the PGC actuators (3 of 5)



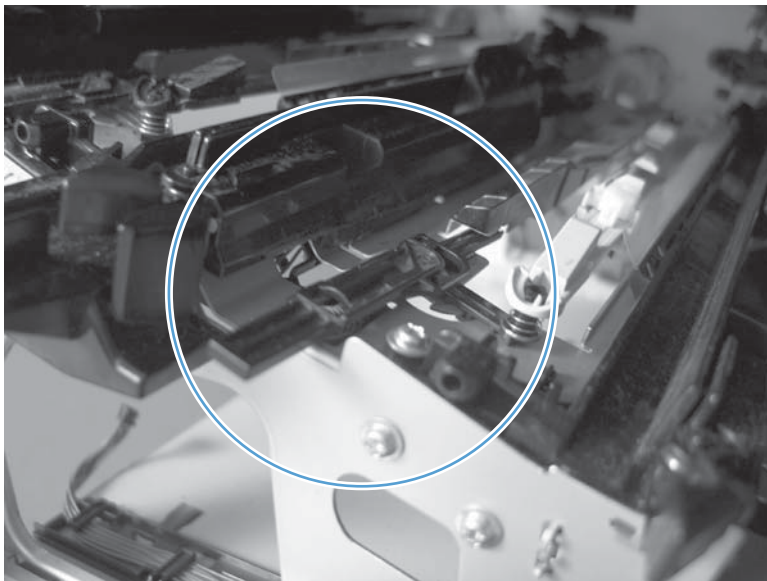
4. Place the end of the actuator into the PGC rod, and then use a small flat blade screw driver to fasten the end of the spring on the tab on the chassis.

Figure 2-269 Reinstall the PGC actuators (4 of 5)



5. Push down on the actuator to seat it into place. Verify that the actuators is correctly installed. The PGC actuator must freely move when you push in on the actuator.

Figure 2-270 Reinstall the PGC actuators (5 of 5)



High-voltage power supply upper (HVPS-T)

Before proceeding, remove the following components:

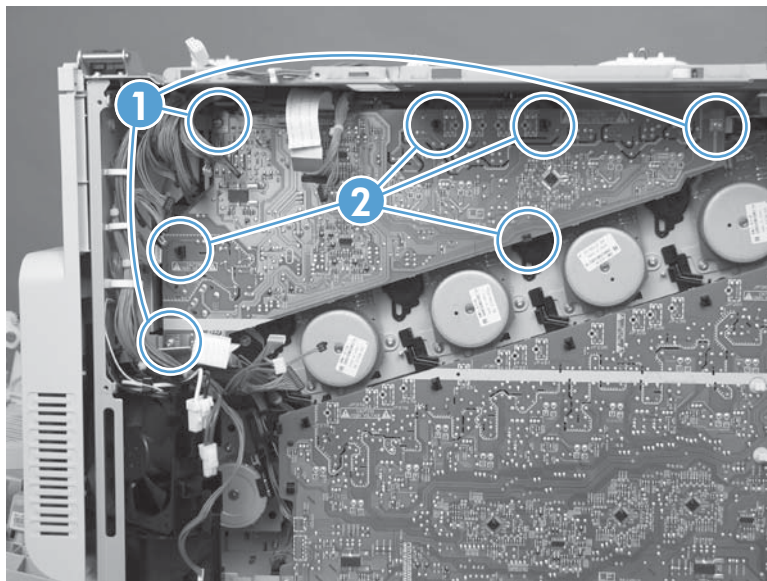
- Formatter. See [Formatter PCA on page 106](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply. See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- DC controller and tray. See [DC controller PCA and tray on page 248](#).

Remove the high-voltage power supply upper

 **CAUTION:**  ESD-sensitive part.

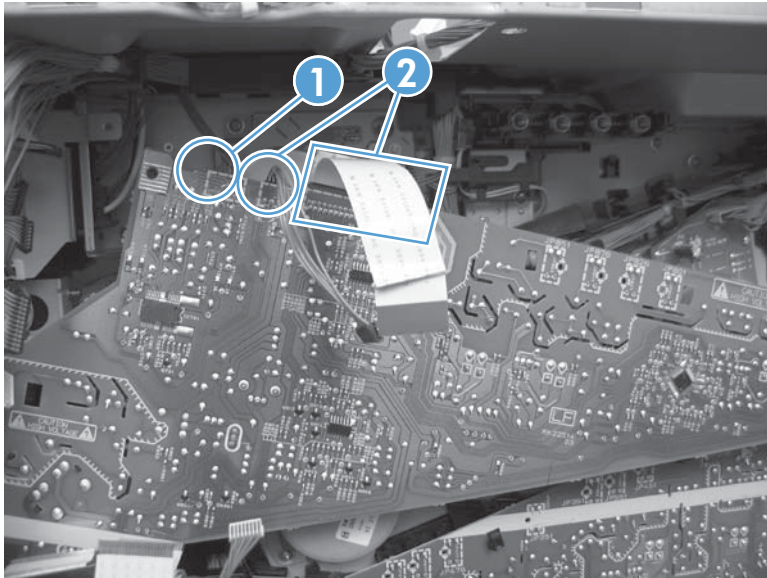
1. Remove three screws (callout 1), and then release four tabs (callout 2).

Figure 2-271 Remove the high-voltage power supply upper (2 of 2)



2. Disconnect one connector (callout 1) and then remove the power supply. **Do not** disconnect two connectors (callout 2)

Figure 2-272 Remove the high-voltage power supply upper (1 of 2)



Reinstall the high-voltage power supply upper

When you reinstall the power supply, look through the holes in the PCA and make sure that the high-voltage contact springs are correctly seated against the PCA.


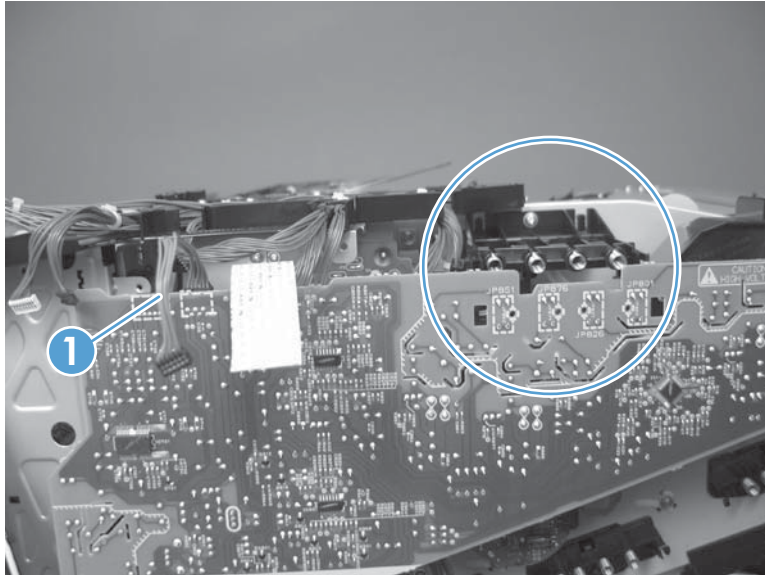
 **NOTE:** For a replacement power supply, remove one wire harness (callout 1) and then install it on the replacement power supply.

Figure 2-273 Reinstall the high-voltage power supply upper



Yellow, magenta, cyan, and black drum motors

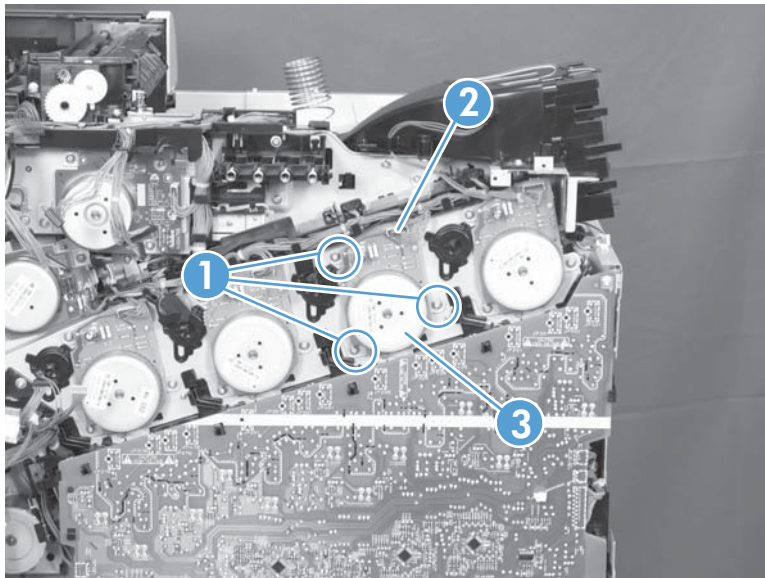
Before proceeding, remove the following components:

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Left cover on page 137](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply. See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- DC controller PCA and tray. See [DC controller PCA and tray on page 248](#).
- High-voltage power supply upper. See [High-voltage power supply upper \(HVPS-T\) on page 286](#).

Remove the yellow, magenta, cyan, and black drum motors

- ▲ For each motor, remove three screws (callout 1), disconnect one connector (callout 2), and then remove the motor (callout 3)

Figure 2-274 Remove the yellow, magenta, cyan, and black drum motors



Fuser motor

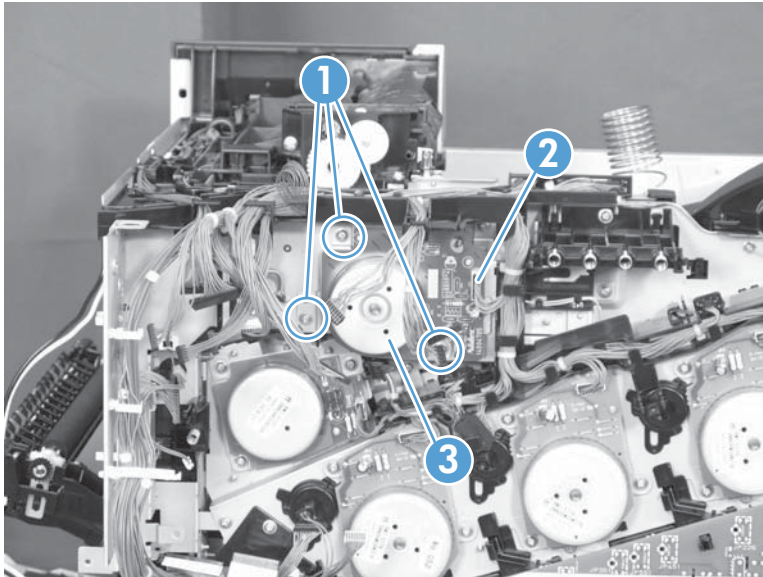
Before proceeding, remove the following components:

- Formatter. See [Formatter PCA on page 106](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Fan cover. See [Fan cover on page 134](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Image scanner power supply unit (PSU). See [Image scanner power supply unit \(PSU\) on page 237](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- DC controller PCA. See [DC controller PCA and tray on page 248](#).
- High-voltage power supply upper. See [High-voltage power supply upper \(HVPS-T\) on page 286](#).

Remove the fuser motor

Remove three screws (callout 1), disconnect one connector (callout 2), and then remove the motor (callout 3).

Figure 2-275 Remove the fuser motor



ITB motor

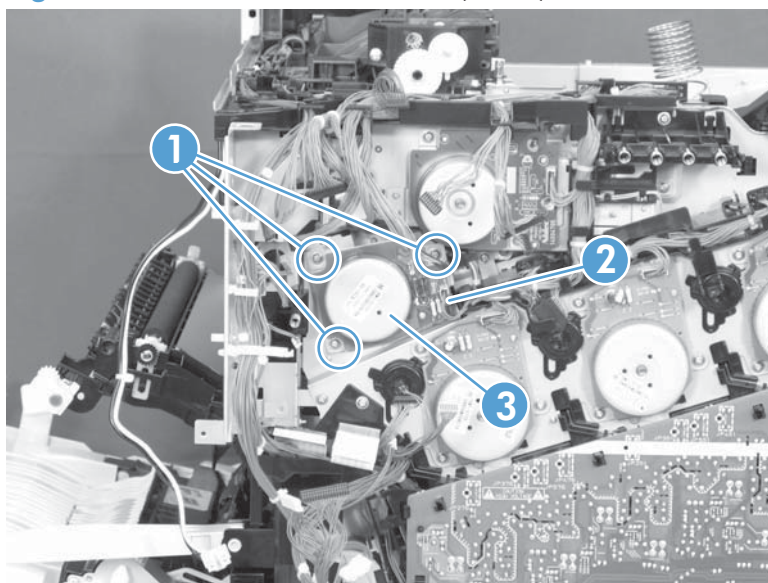
Before proceeding, remove the following components:

- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply. See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- DC controller PCA. See [DC controller PCA and tray on page 248](#).
- High-voltage power supply upper. See [High-voltage power supply upper \(HVPS-T\) on page 286](#).

Remove the ITB motor

- ▲ Remove three screws (callout 1), disconnect one connector (callout 2), and then remove the motor (callout 3).

Figure 2-276 Remove the ITB motor (1 of 2)



Main-drive assembly



NOTE: Removing the main-drive assembly typically requires more than 2 hours to complete.

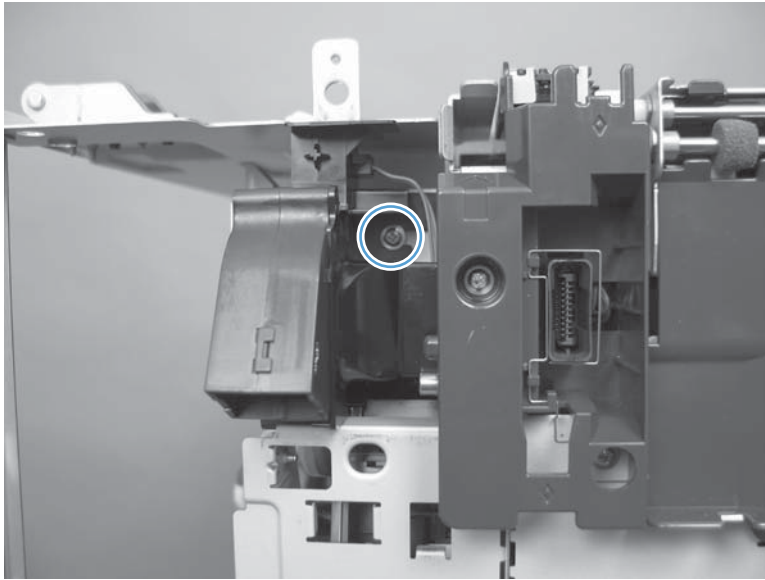
Before proceeding, remove the following components:

- Formatter. See [Formatter PCA on page 106](#).
- Intermediate transfer belt (ITB). See [Intermediate transfer belt \(ITB\) on page 120](#).
- S-CVR-REAR (scanner rear cover). See [S-CVR-REAR \(scanner rear cover\) on page 128](#).
- Fan cover. See [Fan cover on page 134](#).
- Lower-left cover. See [Lower-left cover on page 136](#).
- Left cover. See [Left cover on page 137](#).
- Rear cover. See [Rear cover on page 144](#).
- Document feeder. See [Document feeder on page 151](#).
- Scanner assembly. See [Scanner assembly on page 171](#).
- Image scanner power supply. See [Image scanner power supply unit \(PSU\) on page 237](#).
- Interconnect board (ICB). See [Interconnect board \(ICB\) on page 239](#).
- Low-voltage power supply. See [Low-voltage power supply \(LVPS\) on page 243](#).
- DC controller PCA. See [DC controller PCA and tray on page 248](#).
- High-voltage power supply lower. See [High-voltage power supply lower \(HVPS-D\) on page 250](#).
- Exhaust fan and fan duct. See [Exhaust fan and fan duct on page 256](#).
- High-voltage power supply upper. See [High-voltage power supply upper \(HVPS-T\) on page 286](#).
- Yellow, magenta, cyan, and black drum motors. See [Remove the yellow, magenta, cyan, and black drum motors on page 289](#).

Remove the main-drive assembly

1. Remove one screw and then release the fan from the chassis.

Figure 2-277 Remove the main-drive assembly (1 of 7)



2. Remove eight connectors (callout 1), and then release the wire harnesses from the guides (callout 2).


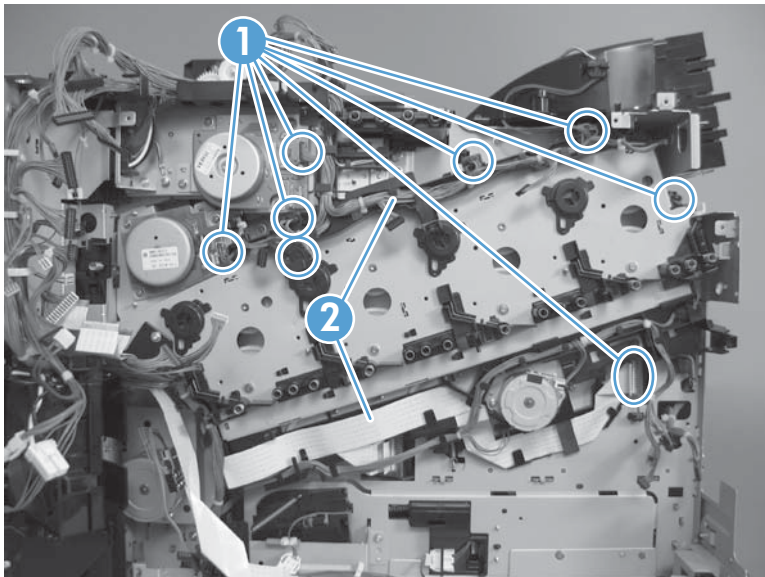
 **NOTE:** Leave the wire harnesses with the product.

Figure 2-278 Remove the main-drive assembly (2 of 7)



3. Remove two screws (callout 1), disconnect one connector (callout 2), and then remove the developing-disengagement motor.


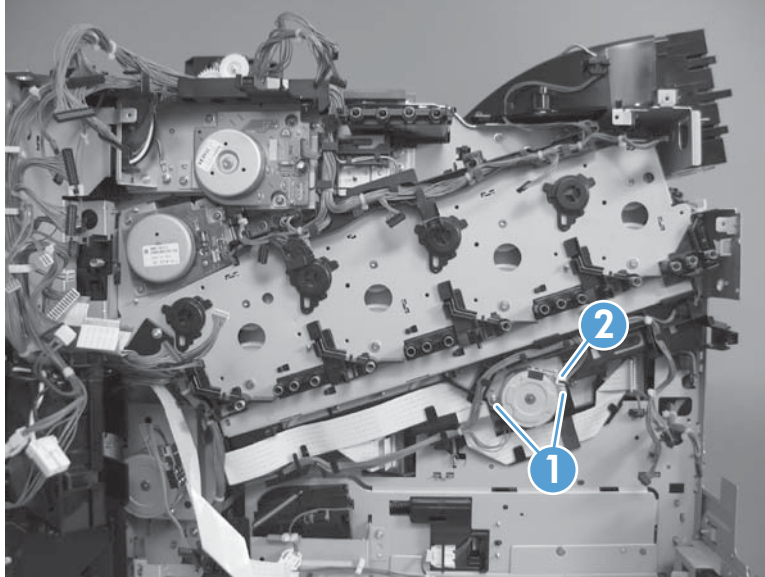
 **NOTE:** When the motor is reinstalled, make sure the motor PCA is positioned at the top of the assembly.

Figure 2-279 Remove the main-drive assembly (3 of 7)



4. Remove one screw (callout 1), and then remove the wire guide from the main-drive assembly (callout 2).


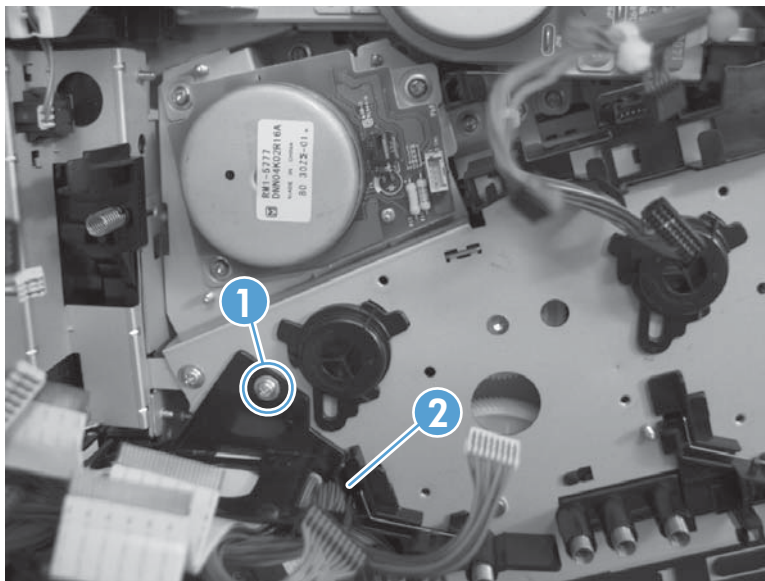
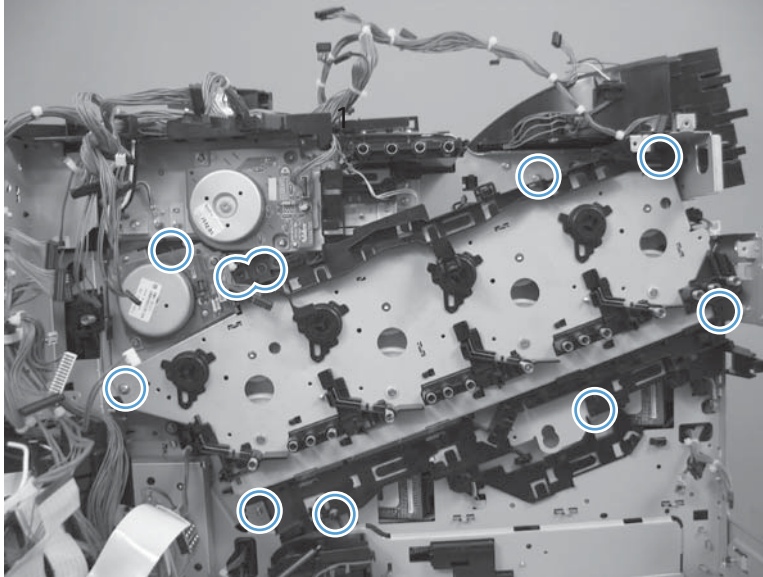
 **NOTE:** Leave the wire harnesses connected to the wire guide and attached to the product for easier reinstallation.

Figure 2-280 Remove the main-drive assembly (4 of 7)



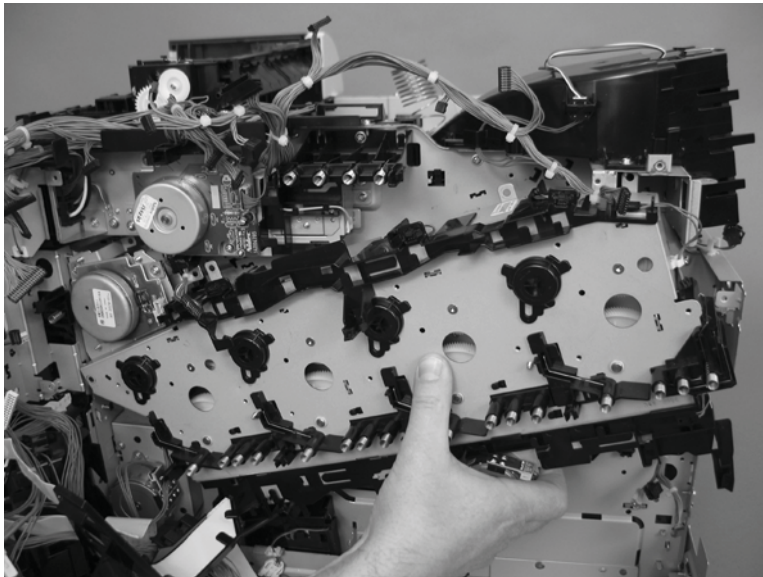
5. Remove 10 screws.

Figure 2-281 Remove the main-drive assembly (5 of 7)



6. Separate the main-drive assembly from the product.

Figure 2-282 Remove the main-drive assembly (6 of 7)



7. Release the wire harness (callout 1) from the guides, and then remove the main-drive assembly from the product.


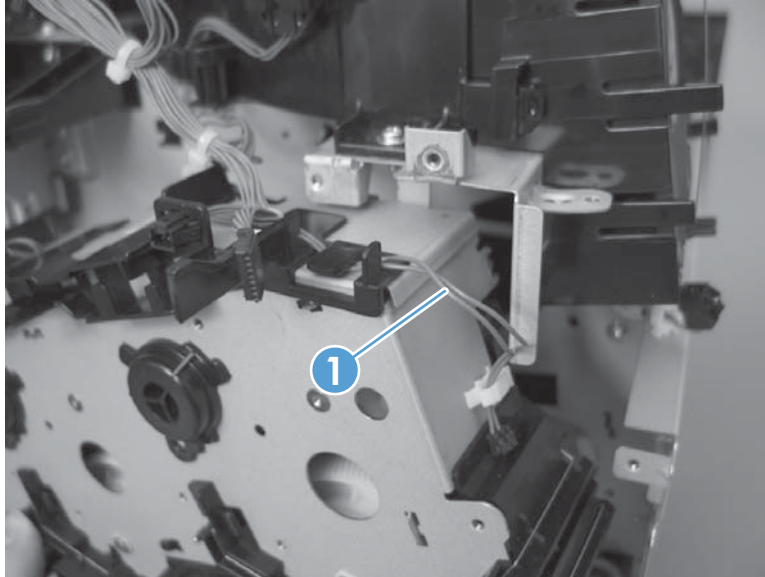

 **Reinstallation tip** It might be easier to pass this harness over the edge of the assembly chassis after the main-drive assembly is reinstalled.

Figure 2-283 Remove the main-drive assembly (7 of 7)



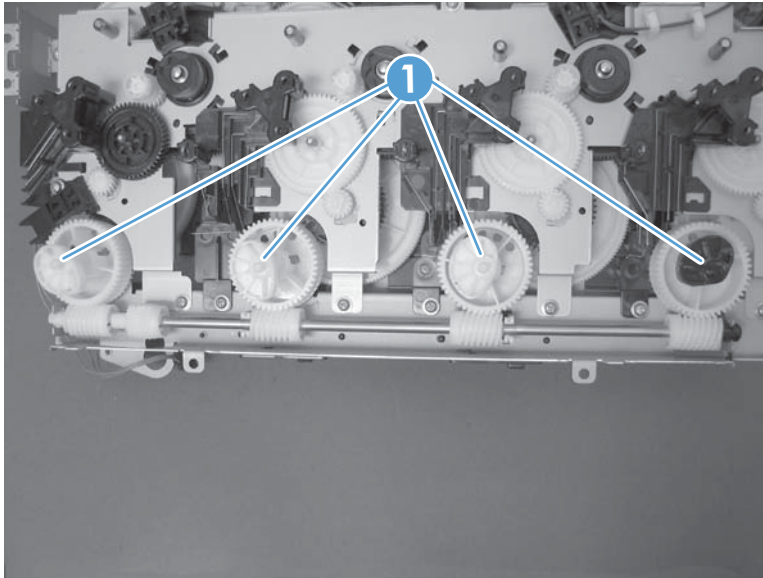
 **CAUTION:** Be careful when you remove the assembly. The cams on the backside of the assembly can be dislodged. If the cams become dislodged, install them on the shafts as shown in [Figure 2-284 Reinstall the main-drive assembly \(1 of 7\) on page 298](#).

The black cam must be installed on the shaft furthest away from the developing-disengagement motor. The white cams are interchangeable.

Reinstall the main-drive assembly

1. Locate the cams (callout 1) on the back side of the assembly.

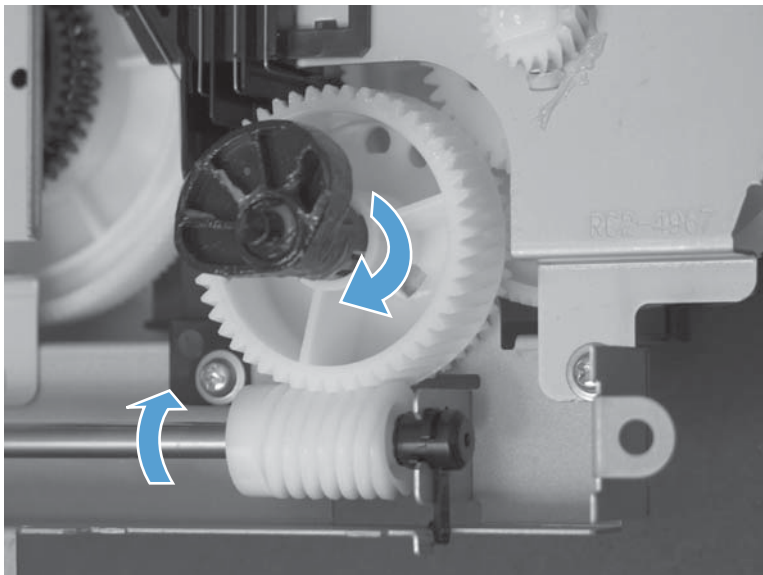
Figure 2-284 Reinstall the main-drive assembly (1 of 7)



2. Slowly rotate the shaft near the black cam.

⚠ WARNING! Do not touch the plastic gears or cams. You must not wipe away any of the grease that is applied to these components. Always rotate the gears and cams by rotating the metal drive shaft.

Figure 2-285 Reinstall the main-drive assembly (2 of 7)



3. Continue to rotate the shaft until the holes in the black-cam gear align as shown below.

When correctly aligned, the *bottom-most* hole in the gear is aligned with a hole in the sheet-metal chassis.


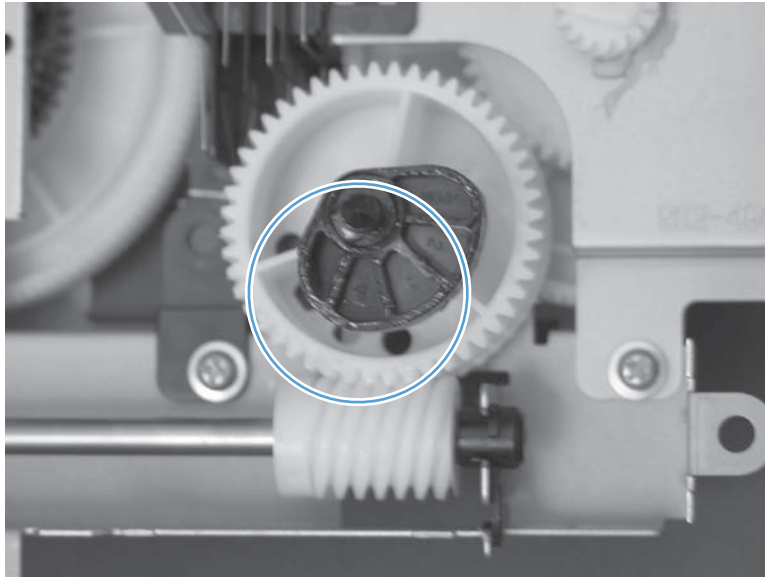

 **NOTE:** The holes in the other cam gears have a different alignment. You must make sure that the holes in the black-cam gear are correctly aligned.

Figure 2-286 Reinstall the main-drive assembly (3 of 7)



4. Verify that the cams (callout 1) align correctly.

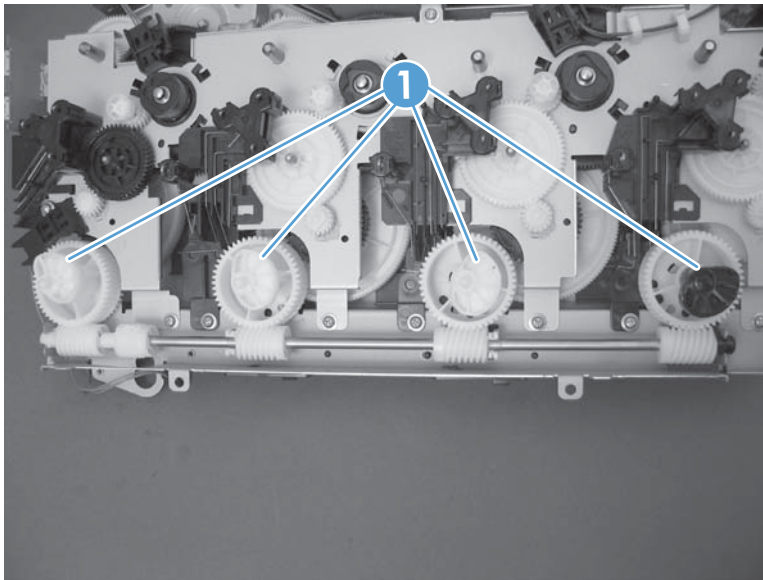
 **TIP:** The second cam in from the right (the white cam to the left of the black cam), should have the *second* hole aligned with the hole in the sheet-metal chassis.

The third cam in from the right, should have the *third* hole aligned with the hole in the sheet-metal chassis.

The fourth cam in from the right (the cam nearest the developing-disengagement motor), should have the *fourth* hole aligned with the hole in the sheet-metal chassis.

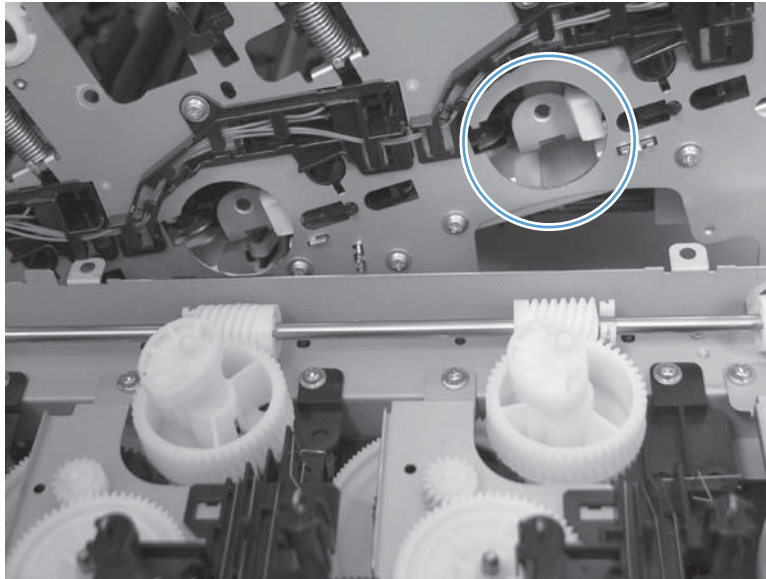
If the second, third, or fourth cams do not correctly align, do the following. Hold the long drive shaft, gently tilt the cam and gear away from the shaft to allow clearance to rotate the gear until the correct hole in the gear aligns with the hole in the chassis.

Figure 2-287 Reinstall the main-drive assembly (4 of 7)



5. When the cams align correctly, they easily fit into the holes in the chassis.

Figure 2-288 Reinstall the main-drive assembly (5 of 7)



6. When placing the assembly on the chassis, align the holes in the assembly with the holes in the chassis.


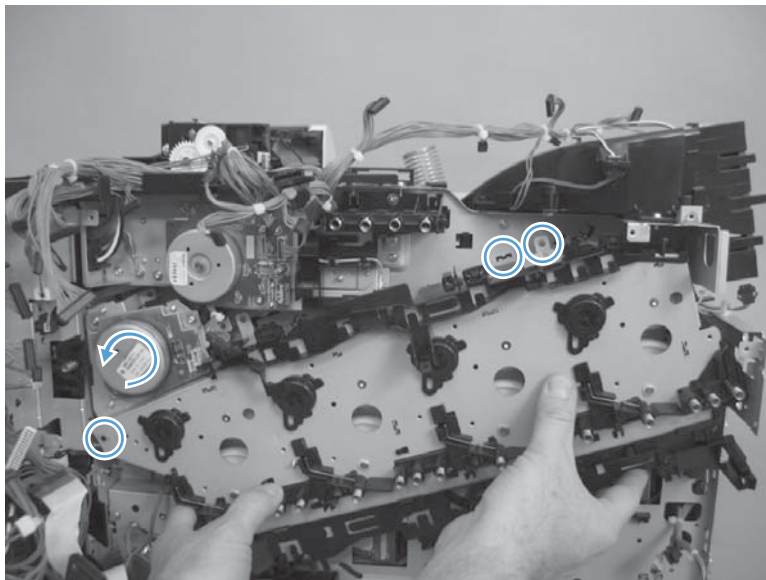
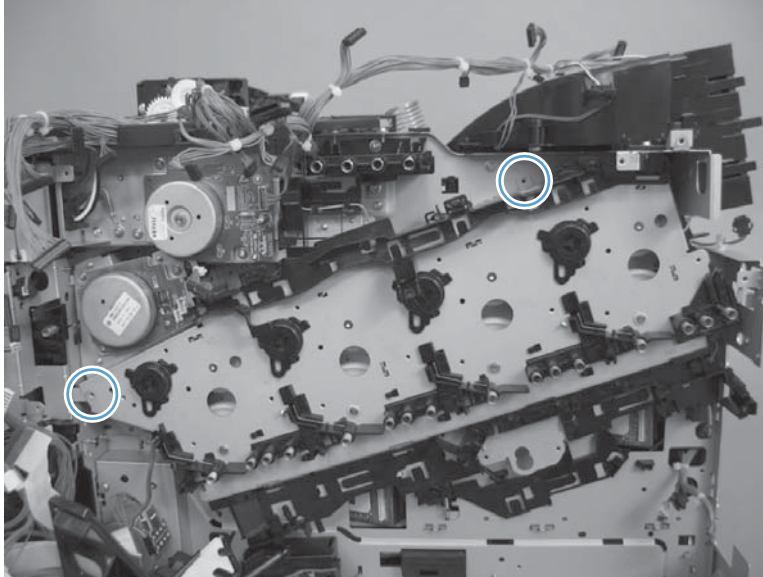
 **Reinstallation tip** If the upper-left corner of the assembly is difficult to seat, you might need to rotate the ITB motor to align the gear shaft with the hole in the chassis.

Figure 2-289 Reinstall the main-drive assembly (6 of 7)



7. When the assembly is correctly installed, the tabs are flat against the chassis.


Figure 2-290 Reinstall the main-drive assembly (7 of 7)



 **TIP:** After reassembling the product, use the [Diagnostics](#) menu to print a [Color Band Test](#) page.

If the test page shows one or more color planes are not printing (usually in the upper left corner of the page), the cam or cams for the missing color plane are not correctly aligned. Repeat the reinstall the main-drive assembly procedure.

Optional paper feeder assemblies (1 x 500-sheet and 3 x 500-sheet)

 **NOTE:** For information about removing the Tray 3, 4, or 5 feed and separation rollers, see [Feed and separation rollers \(Trays 2-5\) on page 113](#).

For information about removing the Tray 3, 4, or 5 cassettes, see [Tray on page 111](#).

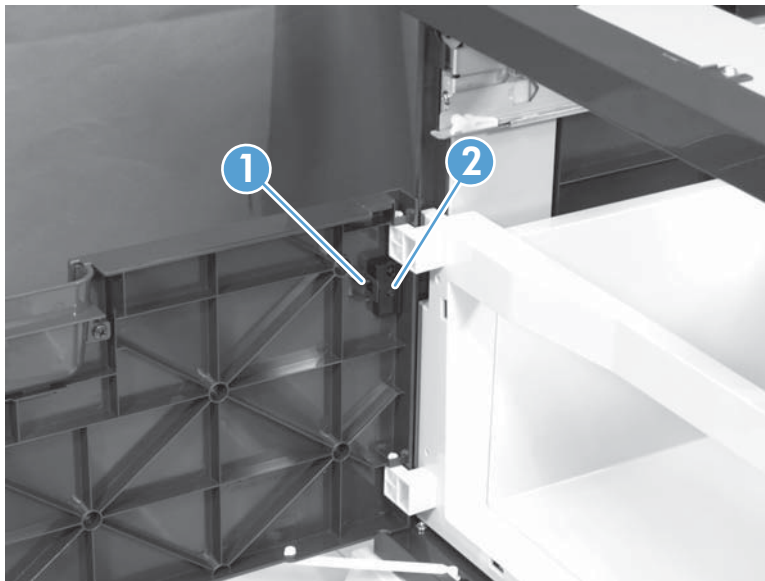
For information about removing the right door (optional paper feeder), see [Right door \(optional paper feeder\) on page 307](#)

The following procedures apply to both the 1 x 500-sheet optional paper feeder and the 3 x 500-sheet optional paper unless specifically noted.

Front door (optional paper feeder)

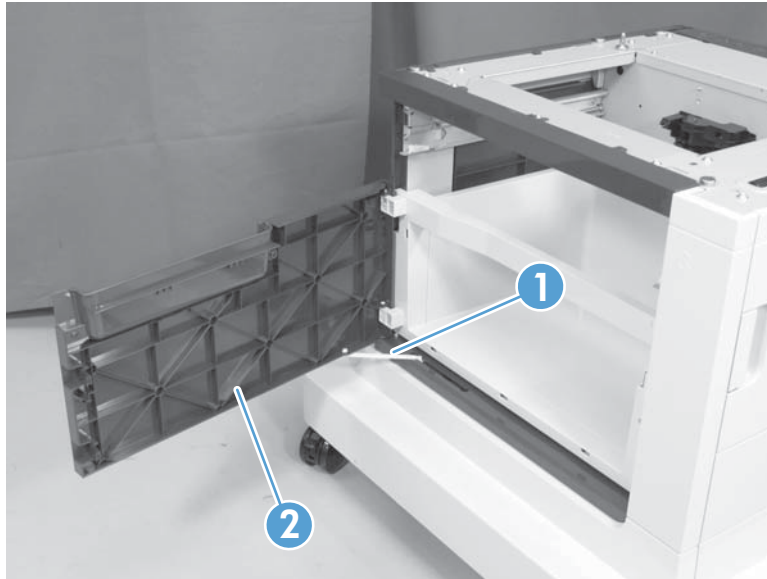
1. Release one tab (callout 1), and then remove the stopper (callout 2).

Figure 2-291 Remove the front door (optional paper feeder) (1 of 2)



2. Release the link arm (callout 1), and then remove the front door (callout 2).

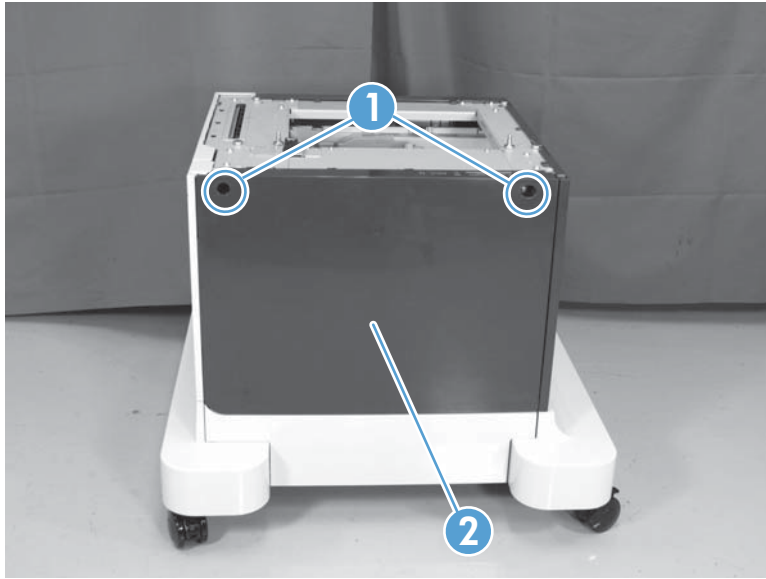
Figure 2-292 Remove the front door (optional paper feeder) (2 of 2)



Rear cover (optional paper feeder)

- ▲ Remove two screws (callout 1), and then remove the rear cover (callout 2).

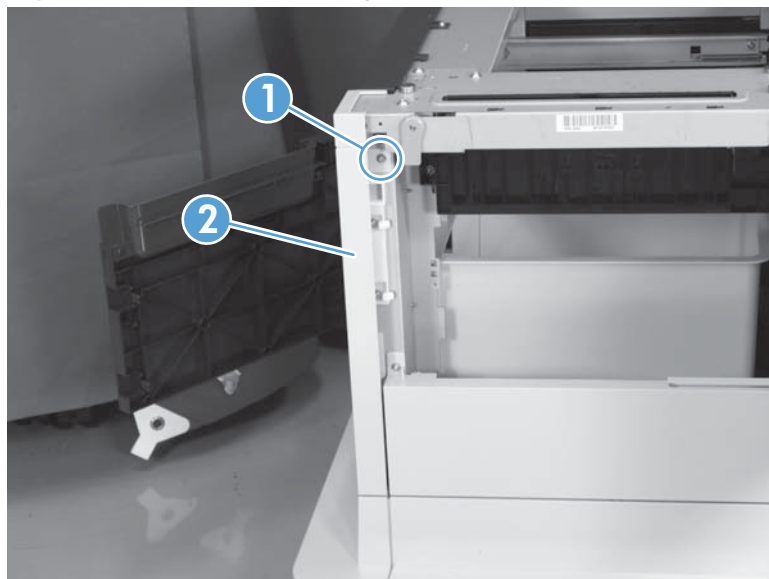
Figure 2-293 Remove the rear cover (optional paper feeder)



Right-front cover (optional paper feeder)

- ▲ Open the front and right doors, remove one screw (callout 1), and then lift the right-front cover (callout 2) to remove.

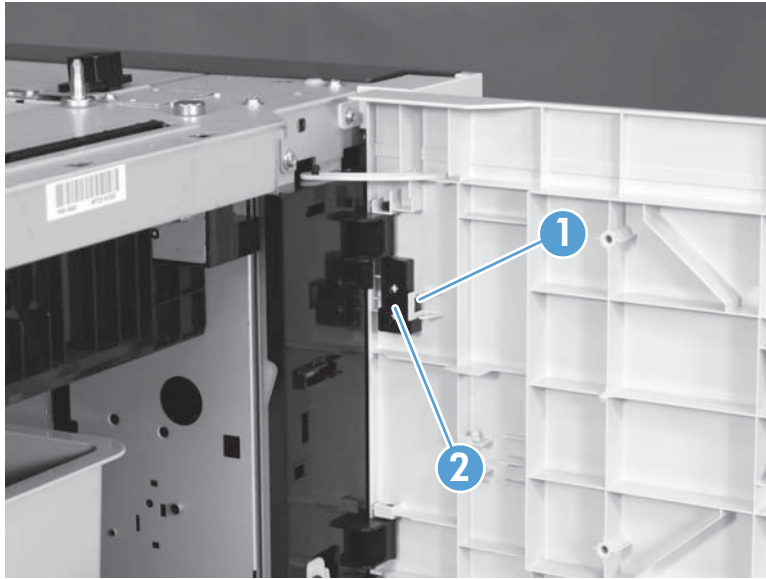
Figure 2-294 Remove the right-front cover (optional paper feeder)



Right door (optional paper feeder)

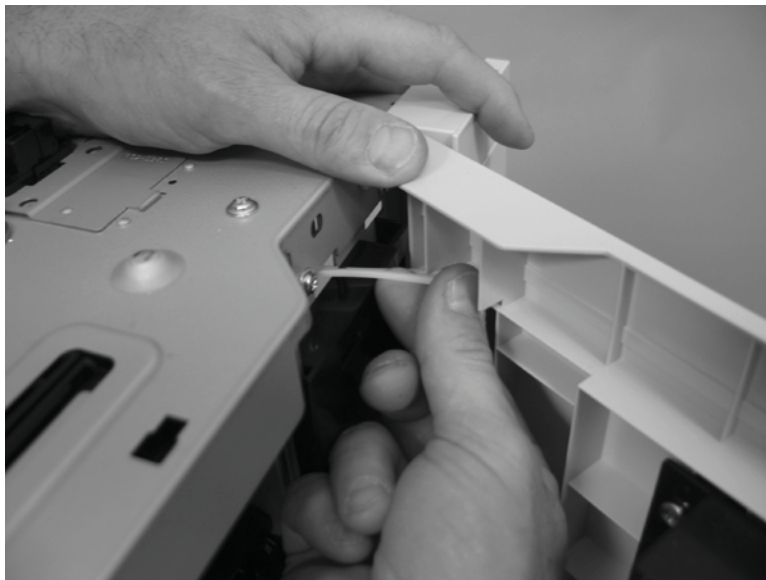
1. Open the right door, release one tab (callout 1), and then remove the stopper (callout 2)

Figure 2-295 Remove the right door (optional paper feeder) (1 of 3)



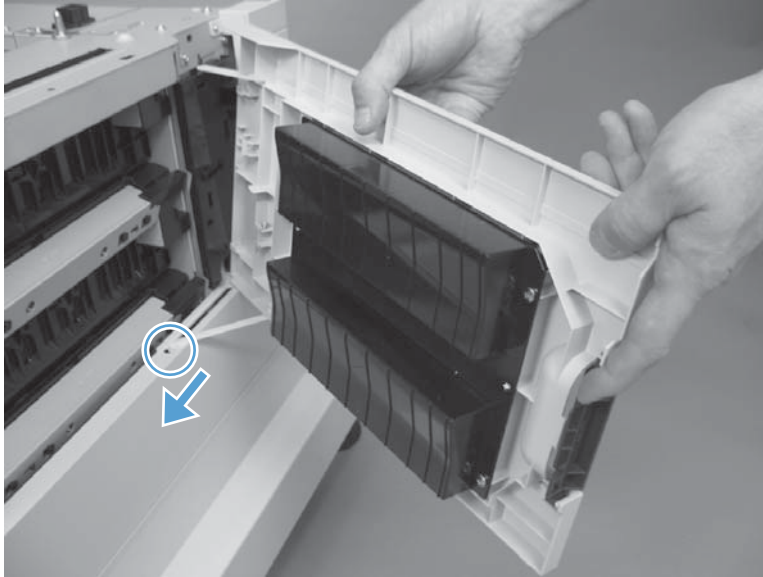
2. Close the right door slightly, and then release the upper link arm.

Figure 2-296 Remove the right door (optional paper feeder) (2 of 3)



3. Slide the door to release the lower link arm, and then remove the right door.

Figure 2-297 Remove the right door (optional paper feeder) (3 of 3)



Left cover (optional paper feeder)

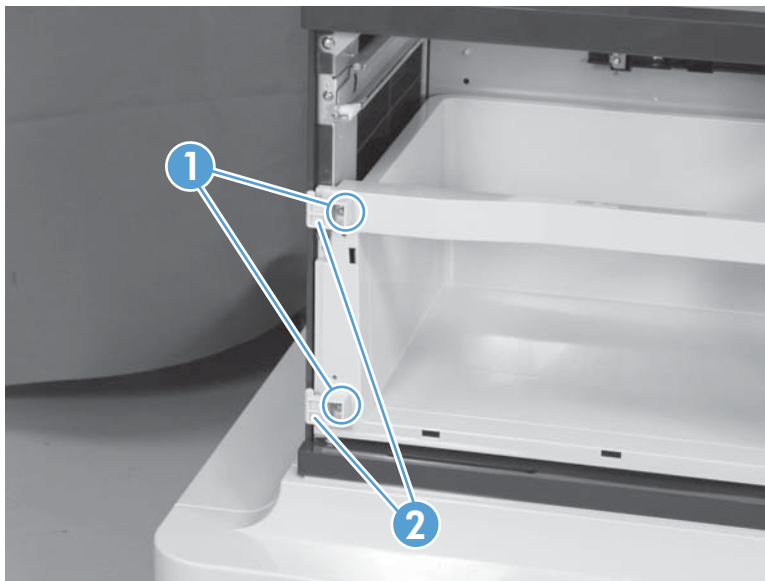
Before proceeding, remove the following components:

- Front door (optional paper feeder). See [Front door \(optional paper feeder\) on page 303](#).
- Right-front cover (optional paper feeder). See [Right-front cover \(optional paper feeder\) on page 306](#).

Remove the left cover (optional paper feeder)

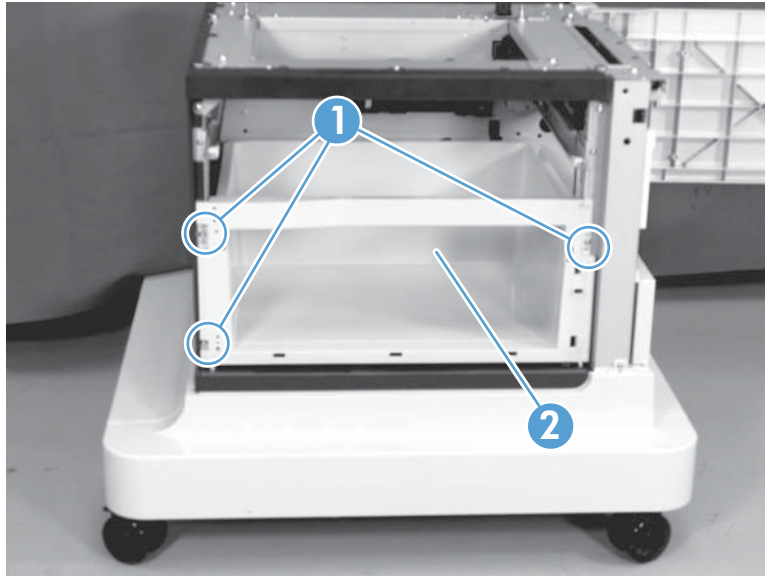
1. **1 x 500 paper feeder only:** Remove two screws (callout 1), and then remove two bushings (callout 2).

Figure 2-298 Remove the left cover (optional paper feeder) (1 of 3)



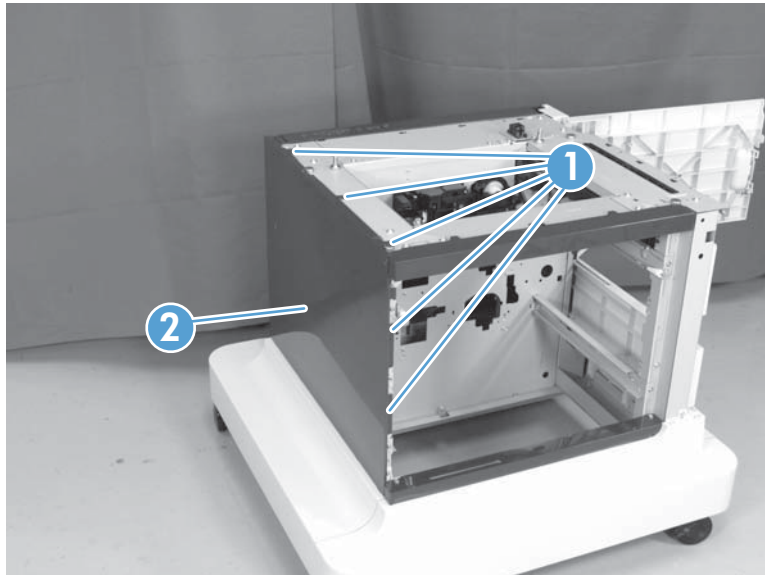
2. **1 x 500 paper feeder only:** Remove three screws (callout 1), and then remove the storage box (callout 2).

Figure 2-299 Remove the left cover (optional paper feeder) (2 of 3)



3. Release five tabs (callout 1), and then remove the left cover (callout 2).

Figure 2-300 Remove the left cover (optional paper feeder) (3 of 3)



Right cover (optional paper feeder)

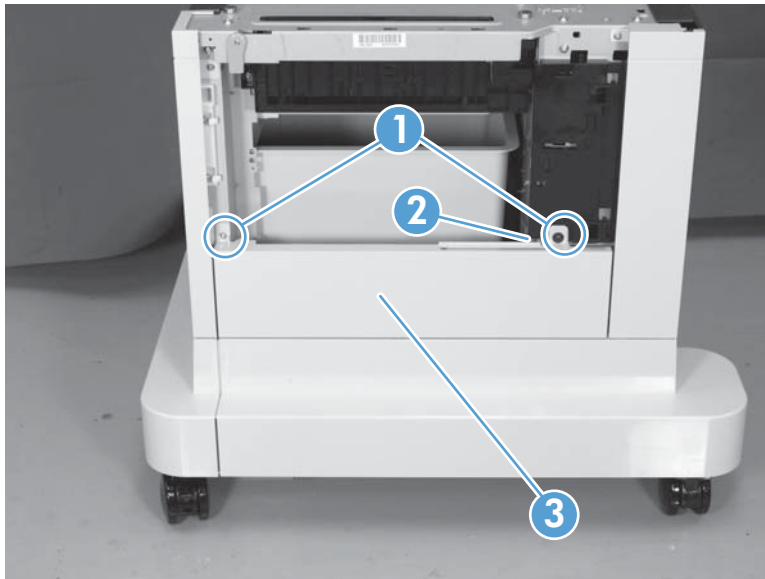
Before proceeding, remove the following components:

- Right door (optional paper feeder). See [Right door \(optional paper feeder\) on page 307](#).

Remove the right cover (optional paper feeder)

- ▲ Remove two screws (callout 1), release one tab (callout 2), and then remove the right cover (callout 3).

Figure 2-301 Remove the right cover (optional paper feeder)



Rear-right cover (optional paper feeder)

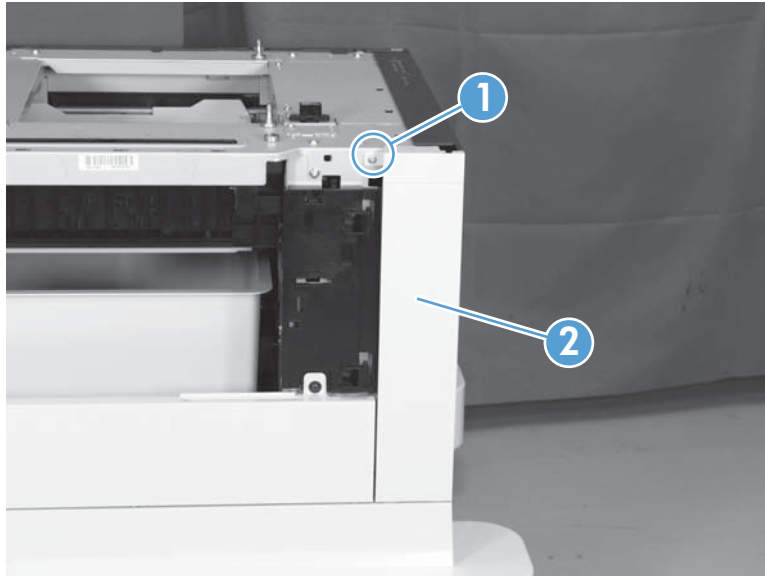
Before proceeding, remove the following components:

- Right door (optional paper feeder). See [Right door \(optional paper feeder\) on page 307](#).

Remove the rear-right cover (optional paper feeder)

- ▲ Remove one screw (callout 1), and then lift the rear-right cover (callout 2) to remove.


Figure 2-302 Remove the rear-right cover (optional paper feeder)



Pickup assembly (optional paper feeder)

Before proceeding, remove the following components:

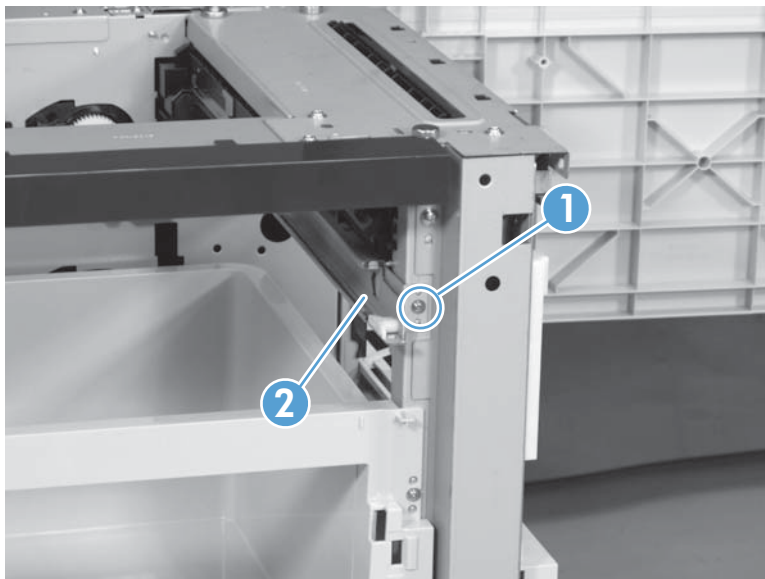
- Paper feeder right front cover. See [Right-front cover \(optional paper feeder\) on page 306](#).
- Paper feeder rear cover. See [Rear cover \(optional paper feeder\) on page 305](#).

 **NOTE:** The following procedure shows steps for removing the pickup assembly for Tray 3. **3 x 500-sheet optional paper feeder only:** The steps for removing the pickup assemblies for Tray 4 and Tray 5 are the same unless noted. You must remove the pickup assemblies in sequence beginning with the pickup assembly for Tray 5.

Remove the pickup assembly (optional paper feeder)

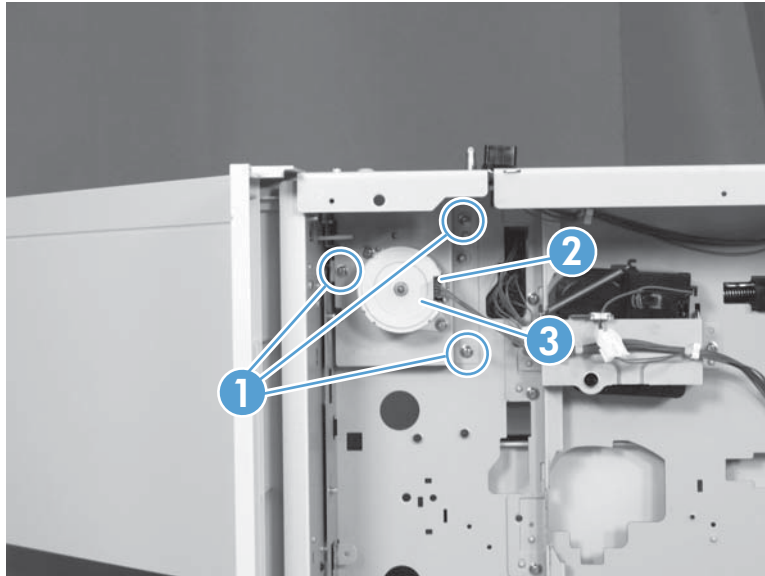
1. Remove one screw (callout 1), and then remove the tray rail (callout 2).

Figure 2-303 Remove the pickup assembly (optional paper feeder) (1 of 5)



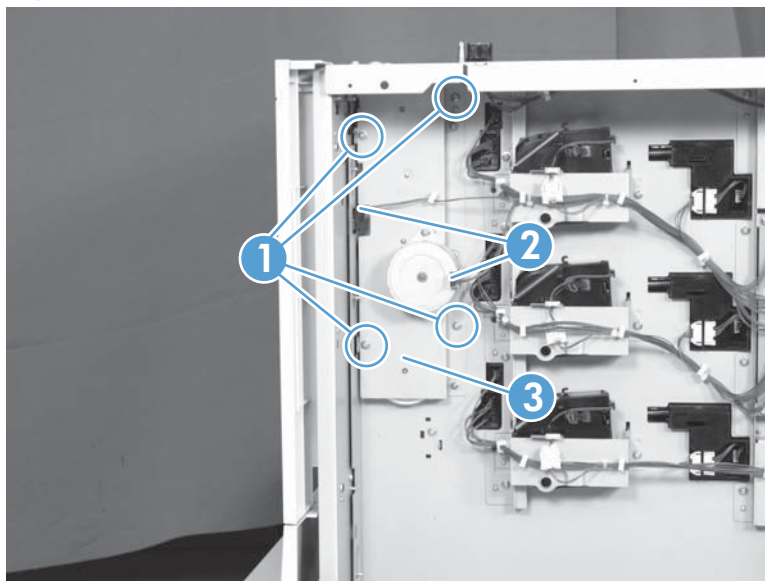
2. **1 x 500-sheet optional paper feeder only:** Remove three screws (callout 1), disconnect one connector (callout 2), and then remove the motor assembly (callout 3).

Figure 2-304 Remove the pickup assembly (optional paper feeder) (2 of 5)



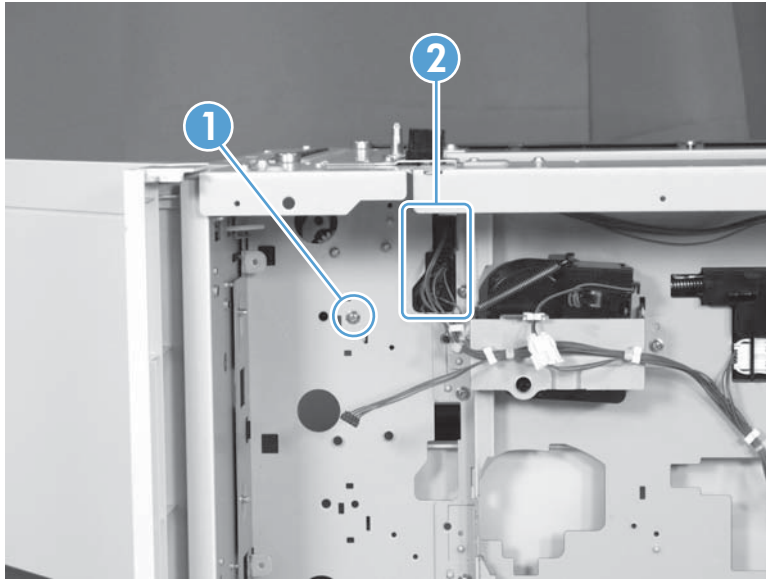
3. **3 x 500-sheet optional paper feeder only:** Remove four screws (callout 1), disconnect two connectors (callout 2), and then remove the motor assembly (callout 3).

Figure 2-305 Remove the pickup assembly (optional paper feeder) (3 of 5)



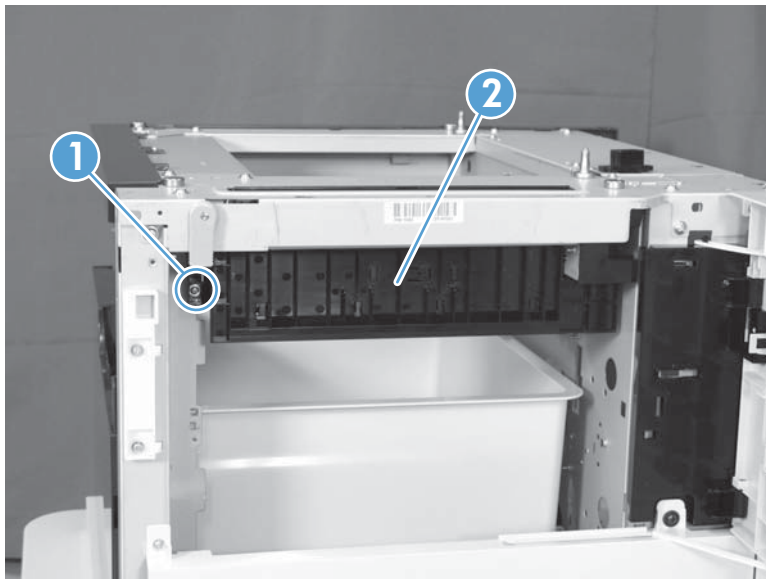
4. Remove one screw (callout 1), and then disconnect three connectors (callout 2).

Figure 2-306 Remove the pickup assembly (optional paper feeder) (4 of 5)



5. Remove one screw (callout 1), and then remove the pickup assembly (callout 2).

Figure 2-307 Remove the pickup assembly (optional paper feeder) (5 of 5)



Lifter assembly (optional paper feeder)

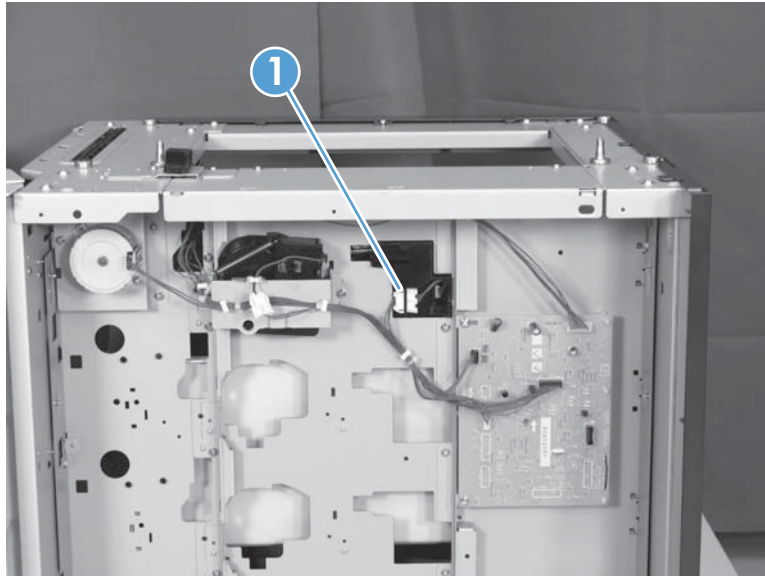
Before proceeding, remove the following components:

- Rear cover (optional paper feeder). See [Rear cover \(optional paper feeder\) on page 305](#).

Remove the lifter assembly (optional paper feeder)

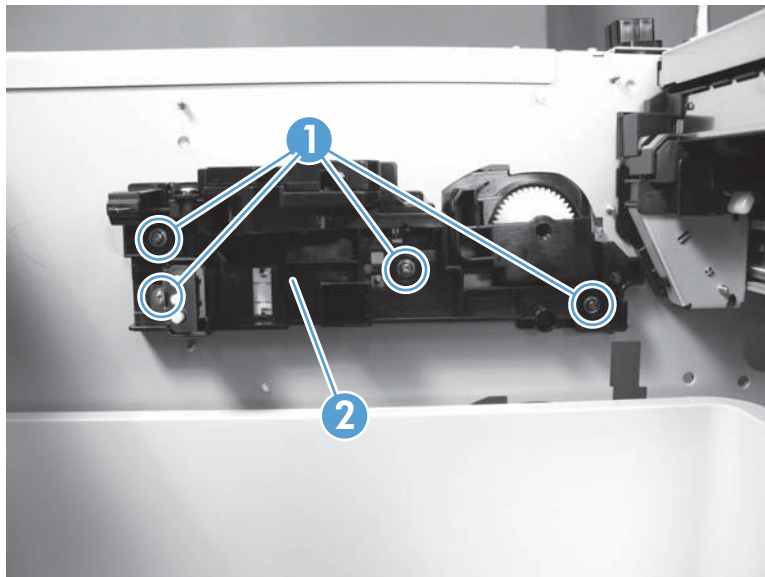
1. Disconnect one connector (callout 1).

Figure 2-308 Remove the lifter assembly (optional paper feeder) (1 of 2)



2. Remove four screws (callout 1), and then remove the lifter assembly (callout 2).

Figure 2-309 Remove the lifter assembly (optional paper feeder) (2 of 2)



Lifter-drive assembly (optional paper feeder)

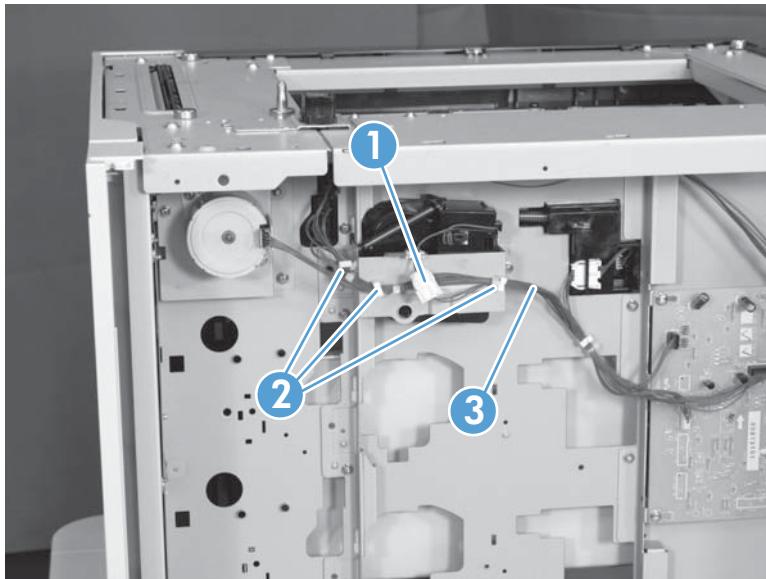
Before proceeding, remove the following components:

- Rear cover (optional paper feeder). See [Rear cover \(optional paper feeder\) on page 305](#).

Remove the lifter-drive assembly (optional paper feeder)

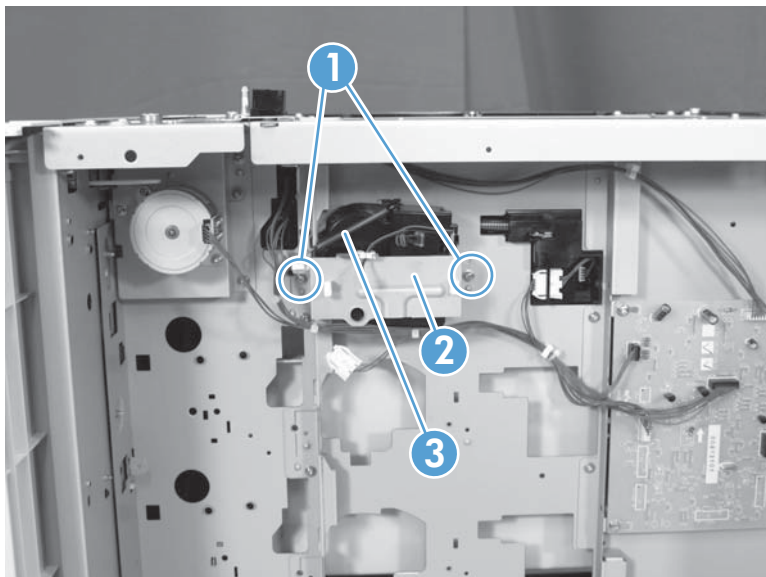
1. Disconnect one connector (callout 1), and then release the wire harnesses (callout 3) from the guides (callout 2).

Figure 2-310 Remove the lifter-drive assembly (optional paper feeder) (1 of 2)



2. Remove two screws (callout 1), and then remove the sheet-metal plate (callout 2). Remove one spring (callout 3), and then remove the lifter drive assembly.

Figure 2-311 Remove the lifter-drive assembly (optional paper feeder) (2 of 2)



Pickup motor assembly (optional paper feeder)

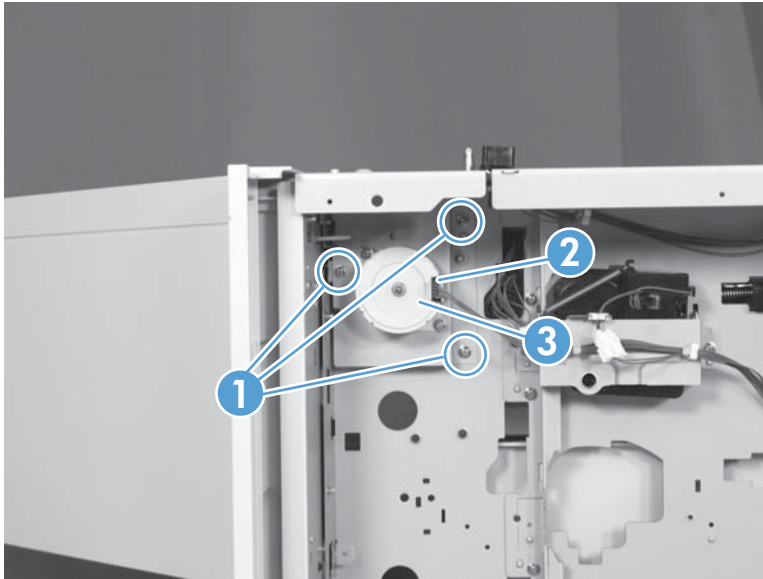
Before proceeding, remove the following components:

- Rear cover (optional paper feeder). See [Rear cover \(optional paper feeder\) on page 305](#).

Remove the pickup motor (optional paper feeder) assembly

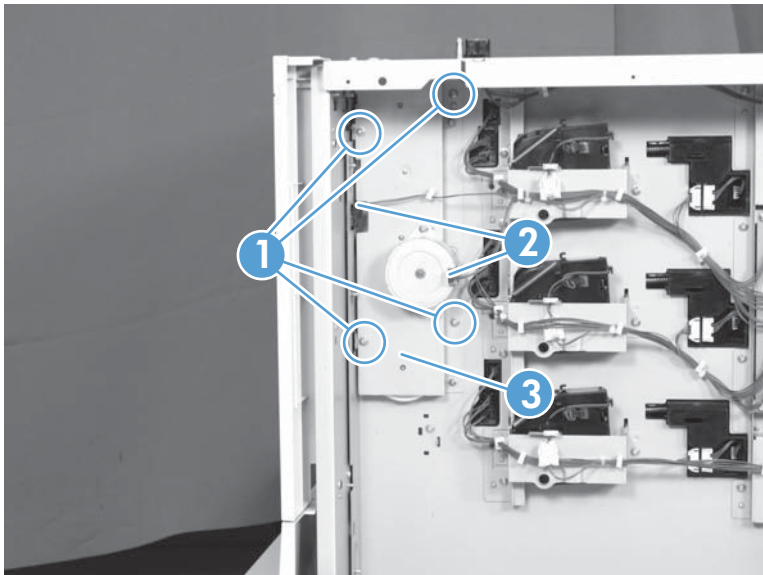
1. **1 x 500-sheet optional paper feeder only:** Remove three screws (callout 1), disconnect one connector (callout 2), and then remove the motor assembly (callout 3).

Figure 2-312 Remove the pickup motor assembly (optional paper feeder) (1 of 2)



2. **3 x 500-sheet optional paper feeder only:** Remove four screws (callout 1), disconnect two connectors (callout 2), and then remove the motor assembly (callout 3).

Figure 2-313 Remove the pickup motor assembly (optional paper feeder) (2 of 2)



Controller PCA (optional paper feeder)

Before proceeding, remove the following components:

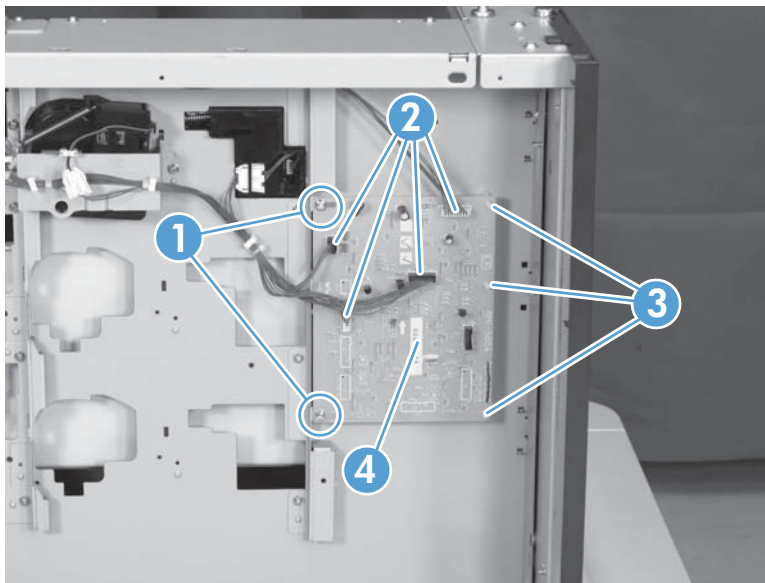
- Rear cover (optional paper feeder). See [Rear cover \(optional paper feeder\) on page 305](#).

Remove the controller PCA (optional paper feeder)

⚠ CAUTION:  ESD-sensitive part.

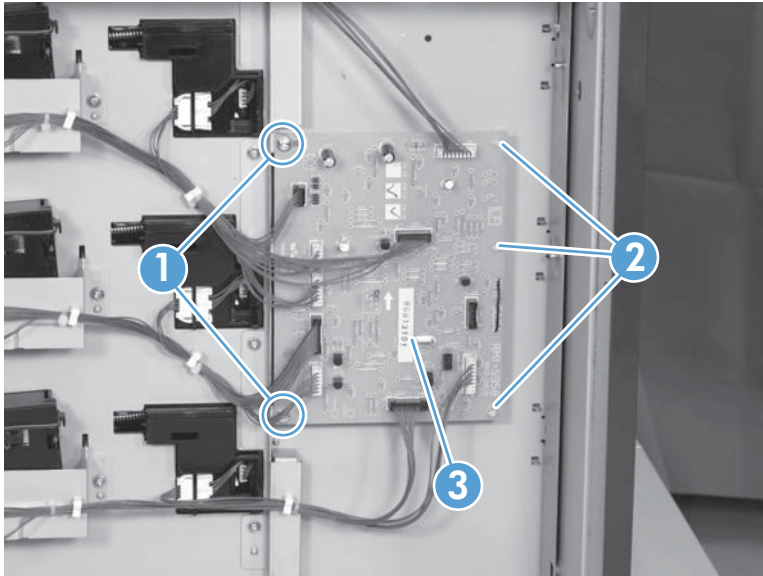
1. **1 x 500-sheet optional paper feeder only:** Disconnect four connector (callout 2), and then remove two screws (callout 1). Release three tabs (callout 3), and then remove the PCA (callout 4).

Figure 2-314 Remove the controller PCA (optional paper feeder) (1 of 2)



2. **3 x 500-sheet optional paper feeder only:** Disconnect all connectors, and then remove two screws (callout 1). Release three tabs (callout 2), and then remove the PCA (callout 3).

Figure 2-315 Remove the controller PCA (optional paper feeder) (2 of 2)



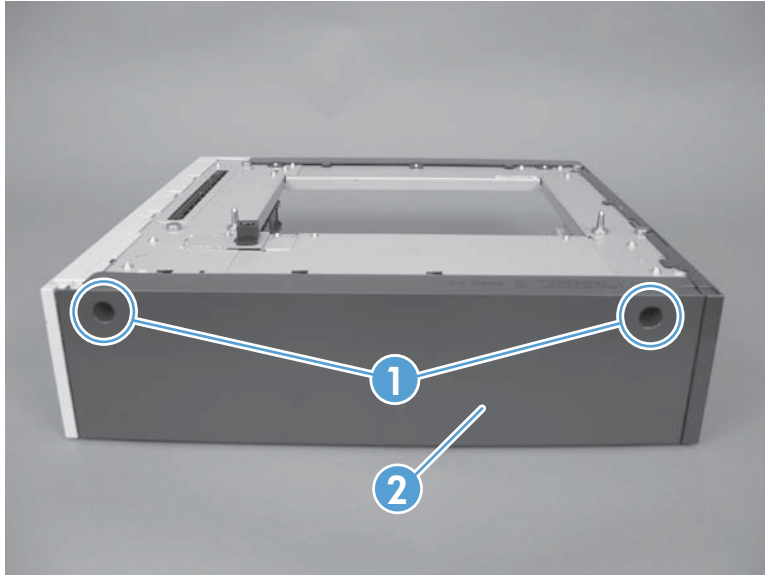
Optional 500-sheet paper feeder assembly

For information about removing the optional paper feeder assemblies (1 x 500-sheet and 3 x 500-sheet), see [Optional paper feeder assemblies \(1 x 500-sheet and 3 x 500-sheet\) on page 303](#)

Rear cover (500-sheet paper feeder)

- ▲ Remove two screws (callout 1), and then remove the rear cover (callout 2).

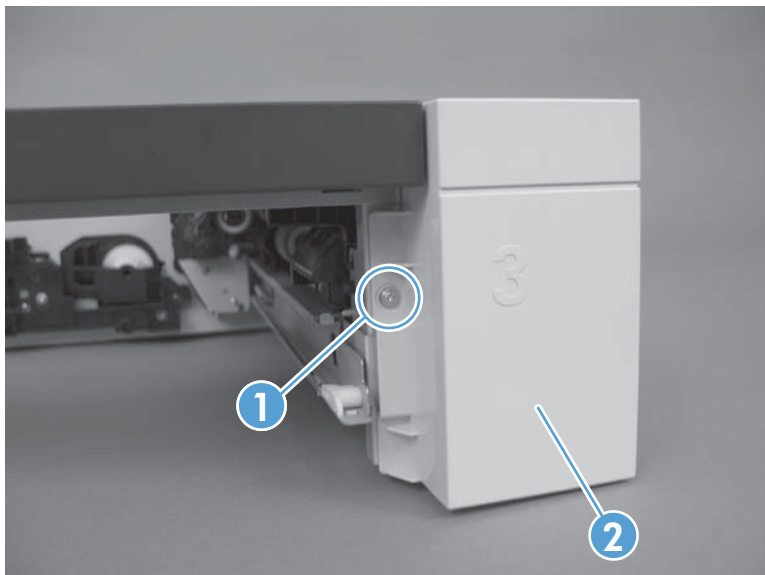
Figure 2-316 Remove the rear cover (500-sheet paper feeder)



Right-front cover (500-sheet paper feeder)

- ▲ Remove one screw (callout 1), and then lift the right-front cover (callout 2) to remove.

Figure 2-317 Remove the right-front cover (500-sheet paper feeder)



Left cover (500-sheet paper feeder)

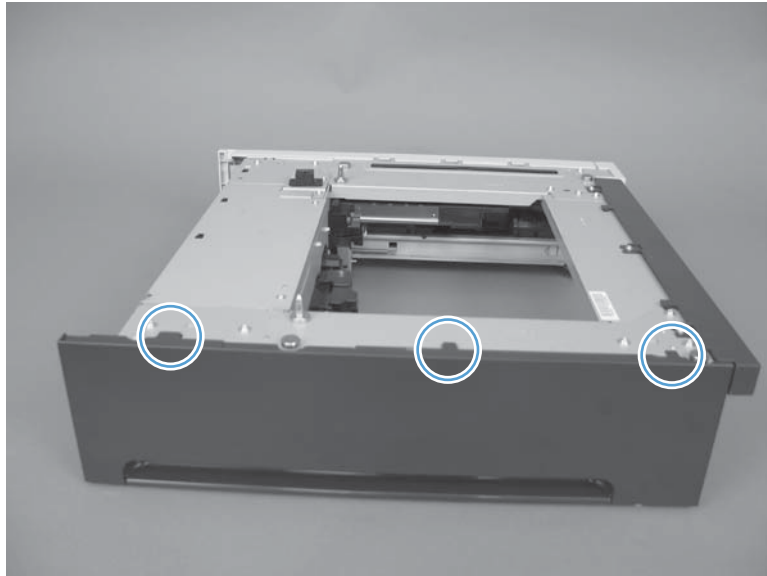
Before proceeding, remove the following components:

- Rear cover (500-sheet paper feeder). See [Rear cover \(500-sheet paper feeder\) on page 321](#).

Remove the left cover (500-sheet paper feeder)

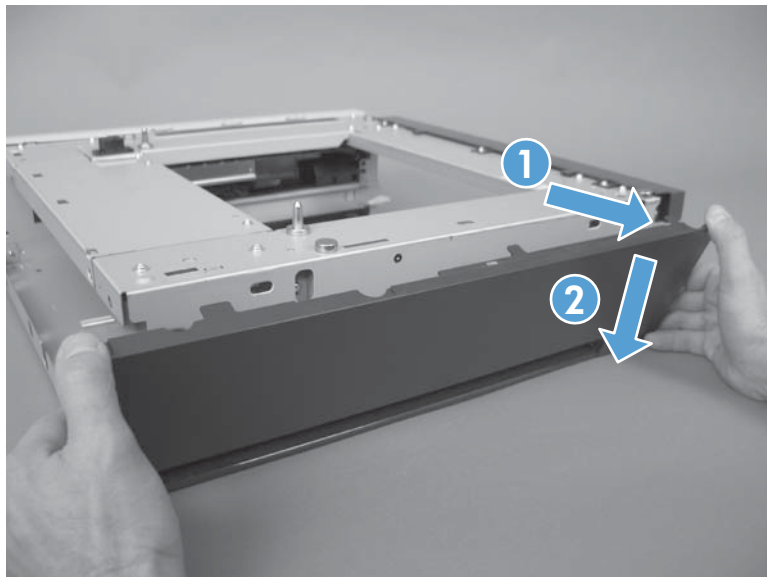
1. Release three tabs.

Figure 2-318 Remove the left cover (500-sheet paper feeder) (1 of 2)



2. Pull the top of the cover out (callout 1), and then press down (callout 2) to remove the cover.

Figure 2-319 Remove the left cover (500-sheet paper feeder) (2 of 2)



Right cover (500-sheet paper feeder)

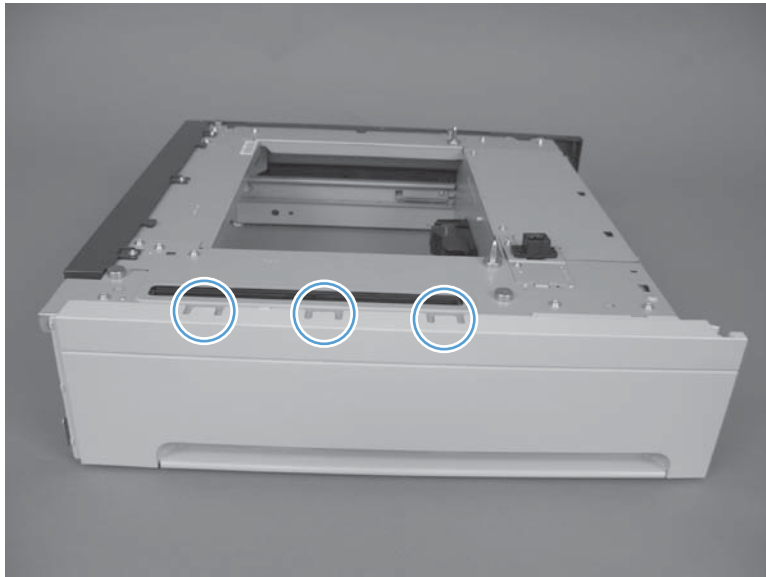
Before proceeding, remove the following components:

- Right front cover (500-sheet paper feeder). See [Right-front cover \(500-sheet paper feeder\) on page 321](#).

Remove the right cover (500-sheet paper feeder)

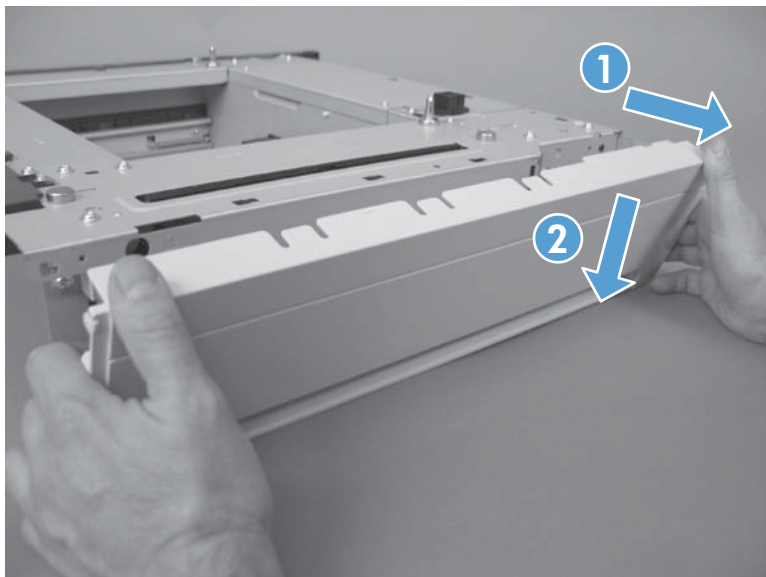
1. Remove two screws (callout 1), release one tab (callout 2), and then remove the right cover (callout 3).

Figure 2-320 Remove the right cover (500-sheet paper feeder) (1 of 2)



2. Pull the top of the cover out (callout 1), and then press down (callout 2) to remove the cover.

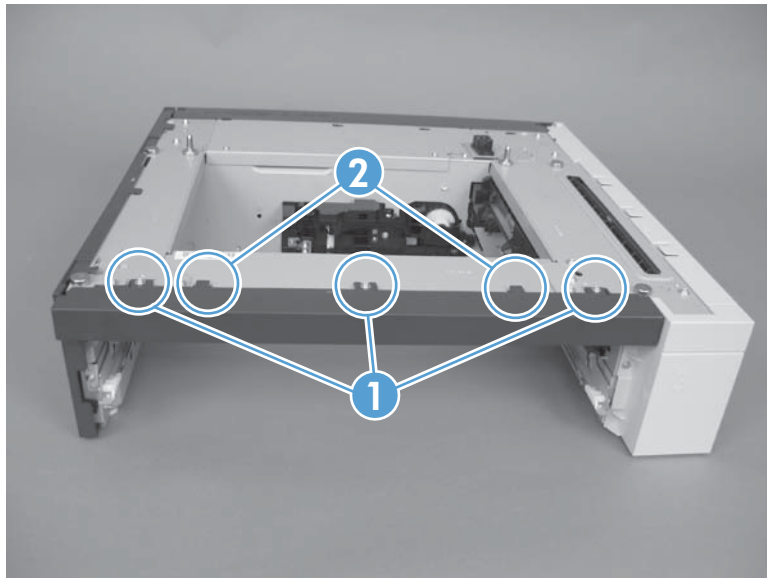
Figure 2-321 Remove the right cover (500-sheet paper feeder) (2 of 2)



Front cover (500-sheet paper feeder)

- ▲ Remove three screws (callout 1), release two tabs (callout 2), and then remove the front cover.

Figure 2-322 Remove the rear-right cover (500-sheet paper feeder)



Pickup assembly (500-sheet paper feeder)

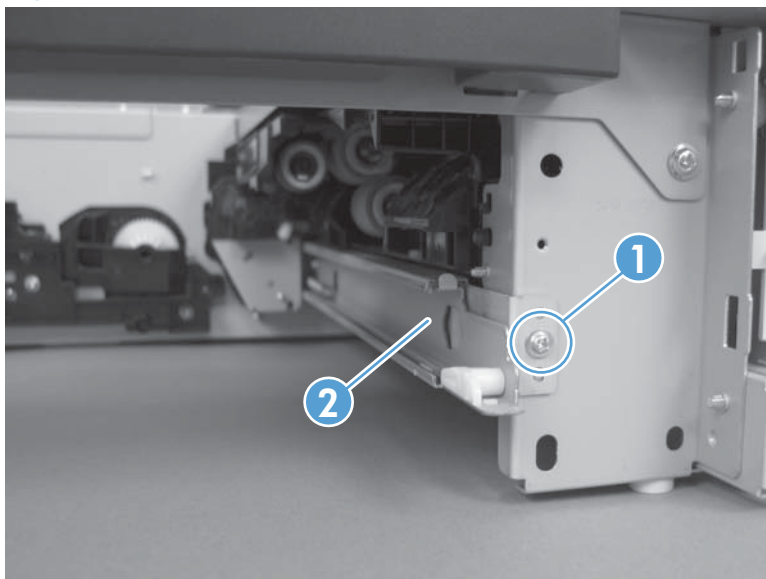
Before proceeding, remove the following components:

- Right front cover (500-sheet paper feeder). See [Right-front cover \(500-sheet paper feeder\) on page 321](#).
- Right cover (500-sheet paper feeder). See [Right cover \(500-sheet paper feeder\) on page 323](#).
- Rear cover (500-sheet paper feeder). See [Rear cover \(500-sheet paper feeder\) on page 321](#).

Remove the pickup assembly (500-sheet paper feeder)

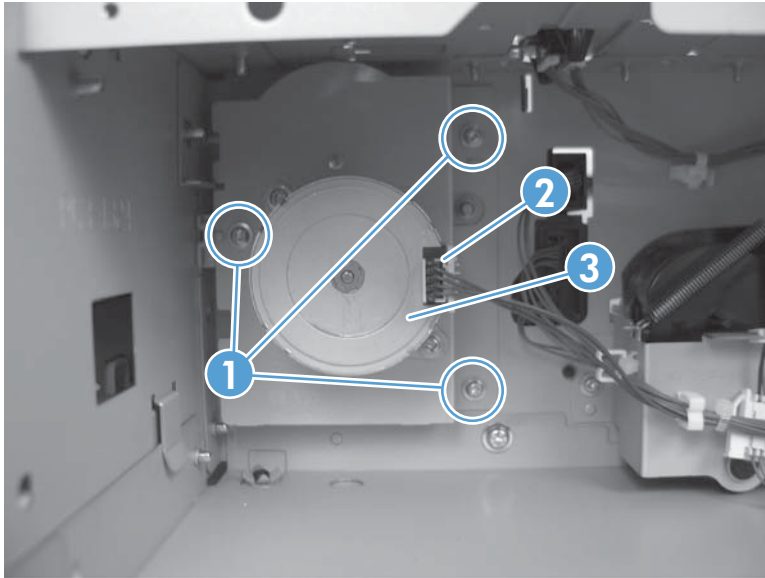
1. Remove one screw (callout 1), and then remove the tray rail (callout 2).

Figure 2-323 Remove the pickup assembly (500-sheet paper feeder) (1 of 5)



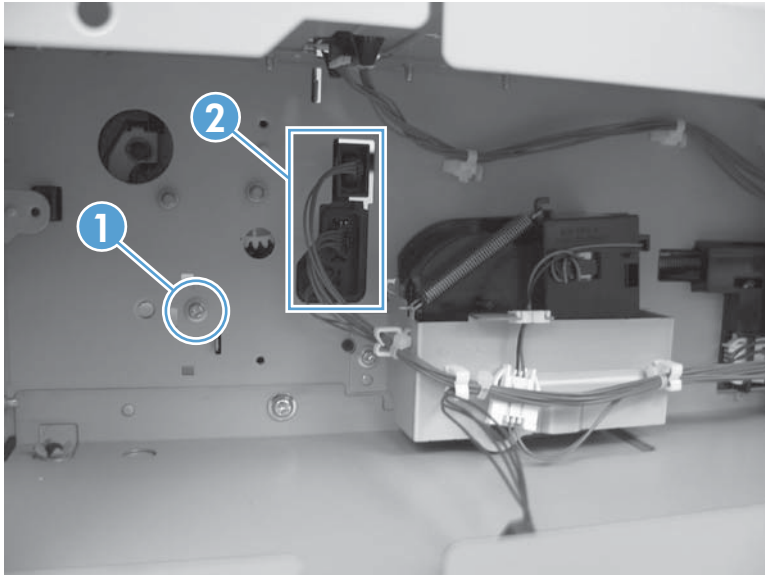
2. Remove three screws (callout 1), disconnect one connector (callout 2), and then remove the motor assembly (callout 3).

Figure 2-324 Remove the pickup assembly (500-sheet paper feeder) (2 of 5)



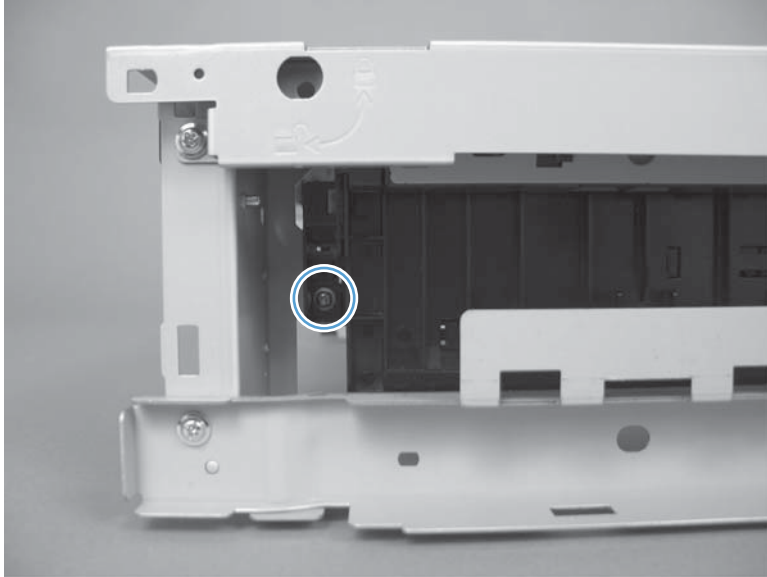
3. Remove one screw (callout 1), and then disconnect three connectors (callout 2).

Figure 2-325 Remove the pickup assembly (500-sheet paper feeder) (3 of 5)



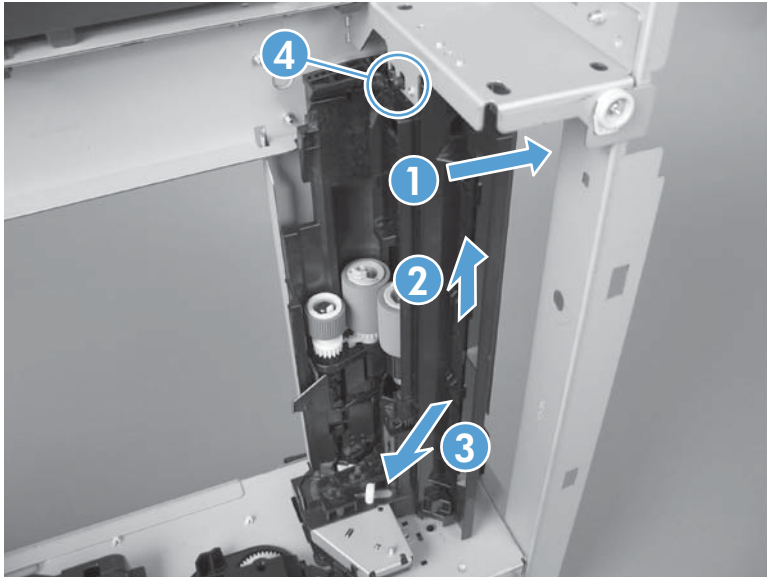
4. Remove one screw.

Figure 2-326 Remove the pickup assembly (500-sheet paper feeder) (4 of 5)



5. Move the top of the assembly to the right (callout 1) until the post (callout 4) is free of the hole. Lift the assembly (callout 2), and then pull the bottom of the assembly (callout 3) to remove.

Figure 2-327 Remove the pickup assembly (500-sheet paper feeder) (5 of 5)



Lifter assembly (500-sheet paper feeder)

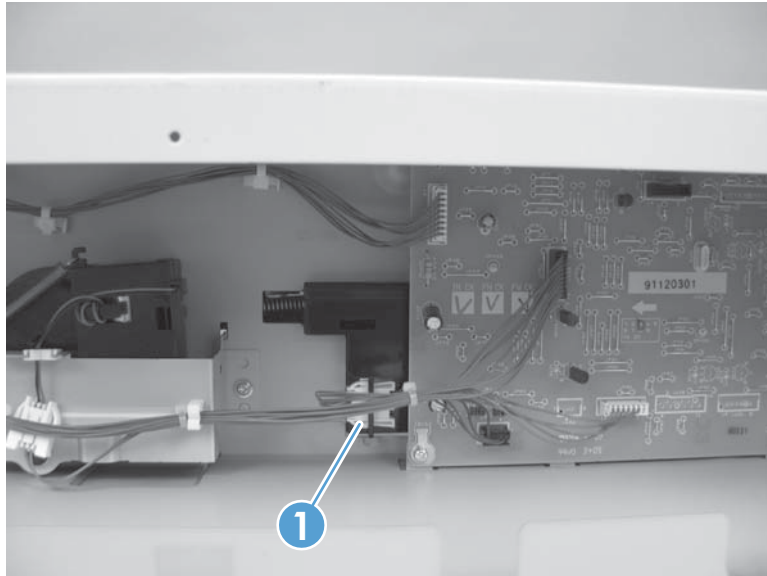
Before proceeding, remove the following components:

- Rear cover (500-sheet paper feeder). See [Rear cover \(500-sheet paper feeder\) on page 321](#).

Remove the lifter assembly (500-sheet paper feeder)

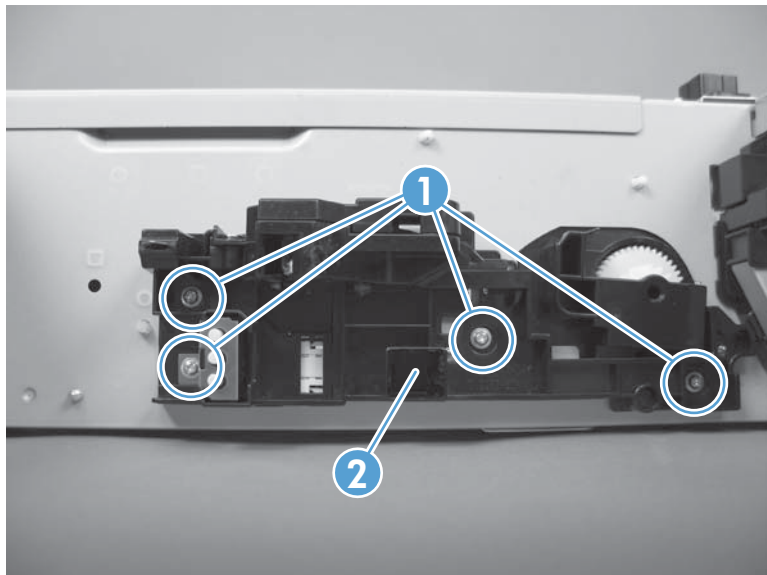
1. Disconnect one connector (callout 1).

Figure 2-328 Remove the lifter assembly (500-sheet paper feeder) (1 of 2)



2. Remove four screws (callout 1), and then remove the lifter assembly (callout 2).

Figure 2-329 Remove the lifter assembly (500-sheet paper feeder) (2 of 2)



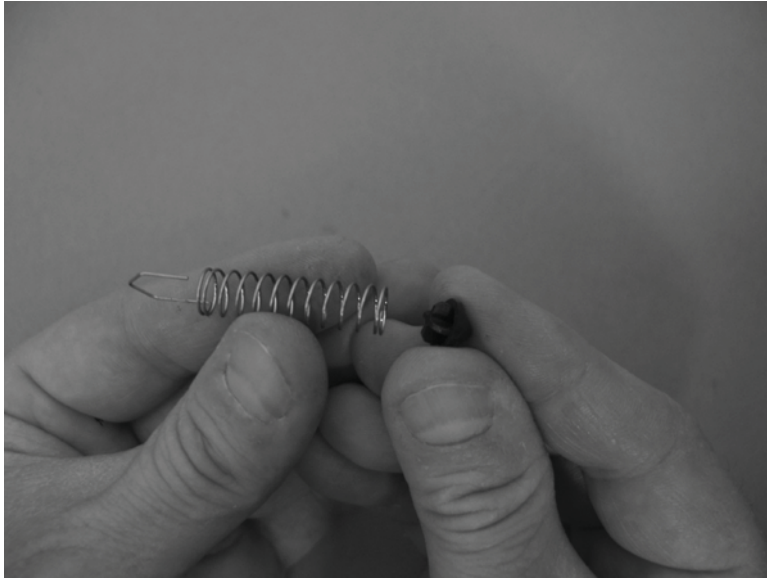
Reinstall the lifter assembly

If the spring falls from the lifter assembly, reinstall it in the lifter before reinstalling the lifter assembly.

Reinstall the lifter assembly

- ▲ Place the spring in the lifter before installing the assembly on the product.

Figure 2-330 Reinstall the lifter assembly (500-sheet paper feeder)



Lifter-drive assembly (500-sheet paper feeder)

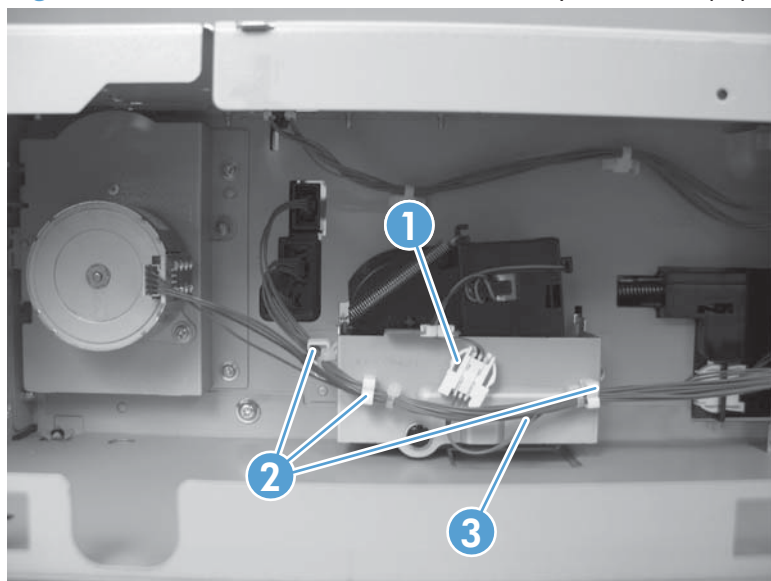
Before proceeding, remove the following components:

- Rear cover (500-sheet paper feeder). See [Rear cover \(500-sheet paper feeder\) on page 321](#).

Remove the lifter-drive assembly (500-sheet paper feeder)

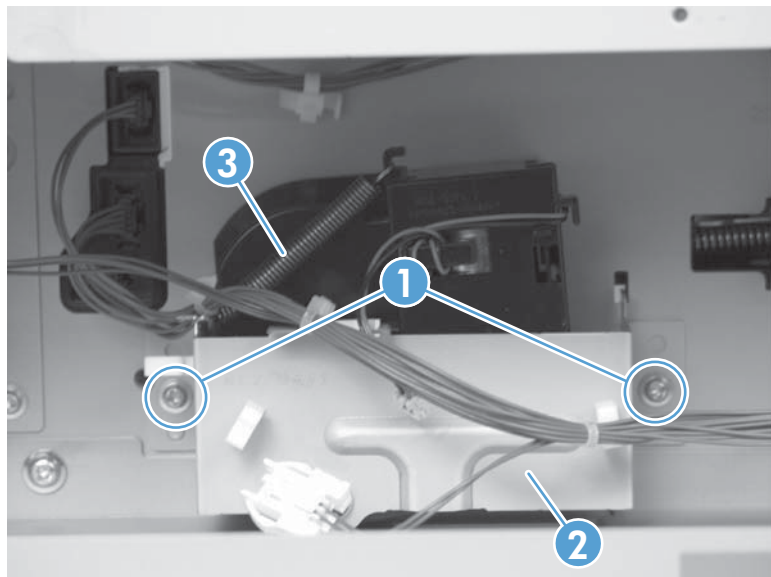
1. Disconnect one connector (callout 1), and then release the wire harnesses (callout 3) from the guides (callout 2).

Figure 2-331 Remove the lifter-drive assembly (500-sheet paper feeder) (1 of 2)



2. Remove two screws (callout 1), and then remove the sheet-metal plate (callout 2). Remove one spring (callout 3), and then remove the lifter drive assembly.

Figure 2-332 Remove the lifter-drive assembly (500-sheet paper feeder) (2 of 2)



Pickup motor assembly (500-sheet paper feeder)

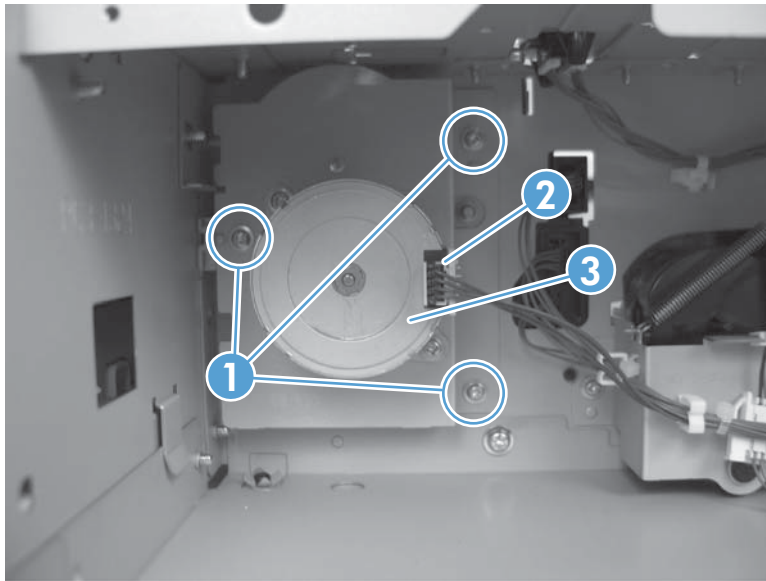
Before proceeding, remove the following components:

- Rear cover (500-sheet paper feeder). See [Rear cover \(500-sheet paper feeder\) on page 321](#).

Remove the pickup motor (500-sheet paper feeder) assembly

- ▲ Remove three screws (callout 1), disconnect one connector (callout 2), and then remove the motor assembly (callout 3).

Figure 2-333 Remove the pickup motor assembly (500-sheet paper feeder)



Controller PCA (500-sheet paper feeder)

Before proceeding, remove the following components:

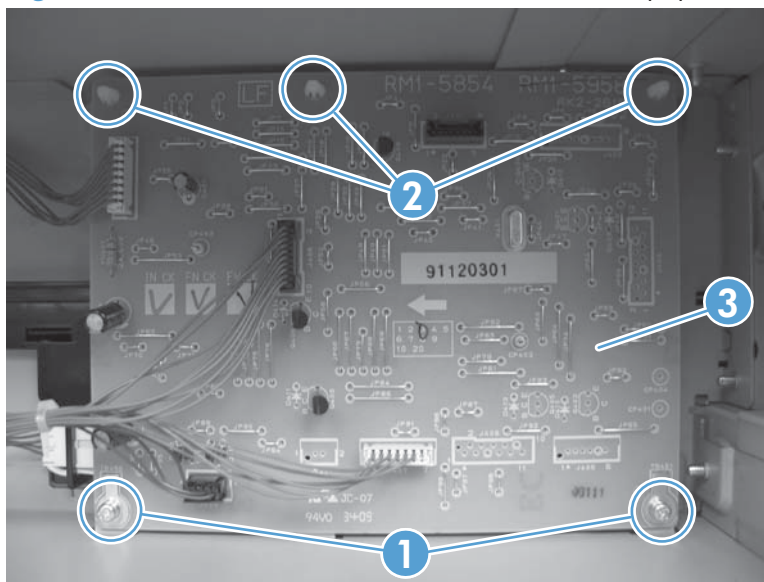
- Rear cover (500-sheet paper feeder). See [Rear cover \(500-sheet paper feeder\) on page 321](#).

Remove the controller PCA (500-sheet paper feeder)

⚠ CAUTION:  ESD-sensitive part.


- ▲ Disconnect all connectors, and then remove two screws (callout 1). Release three tabs (callout 2), and then remove the PCA (callout 3).

Figure 2-334 Remove the controller PCA (500-sheet paper feeder)



Stapling mailbox

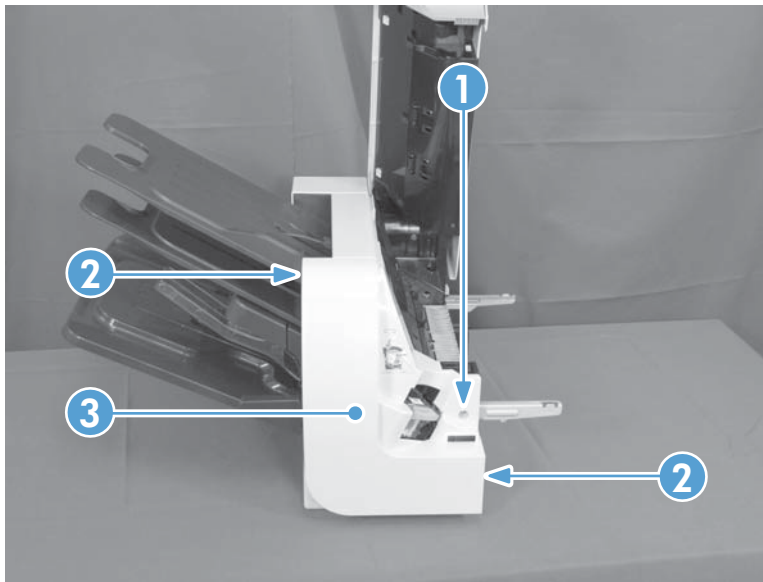
This section provides stapling mailbox removal and replacement procedures.

 **NOTE:** The stapling mailbox is also referred to as the SSMBM.

Stapling mailbox front cover

- ▲ Open the stapling mailbox door, remove one screw (callout 1), release two tabs (callout 2), and then remove the front cover (callout 3).

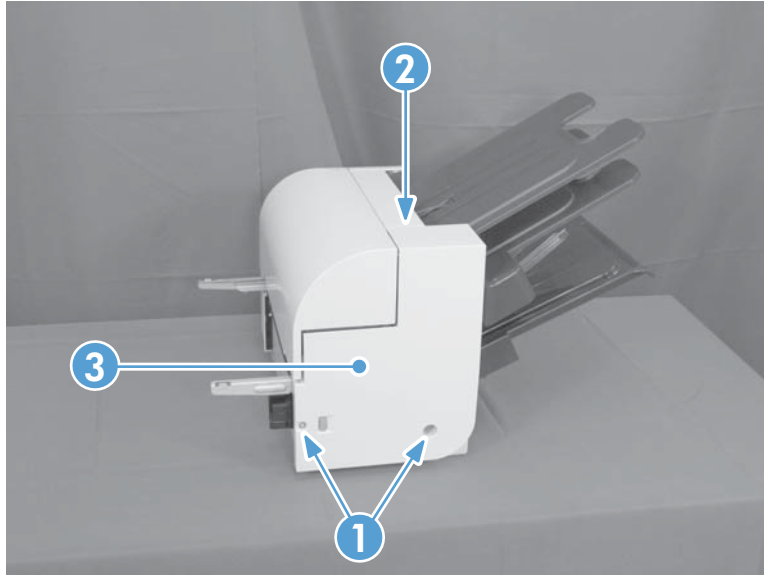
Figure 2-335 Remove the stapling mailbox front cover



Stapling mailbox rear cover

- ▲ Remove two screws (callout 1), release one tab (callout 2), and then remove the rear cover (callout 3).

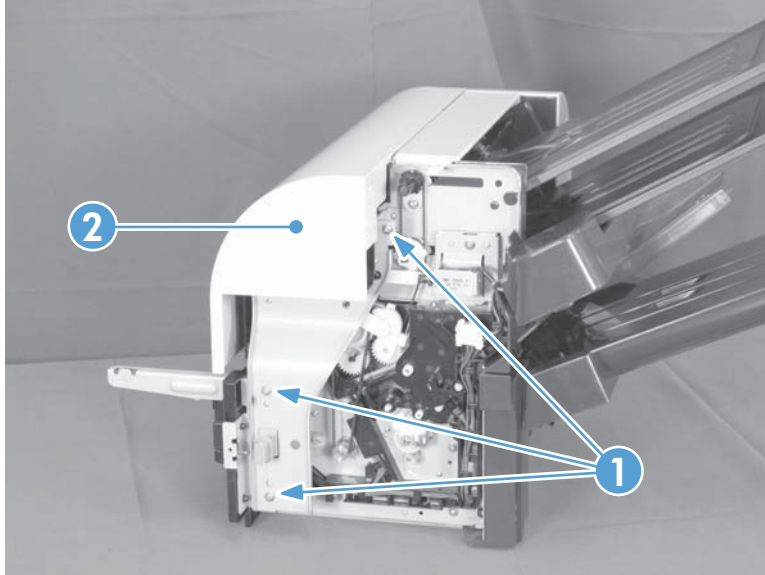
Figure 2-336 Remove the stapling mailbox rear cover



Stapling mailbox door

1. Remove the following components or assemblies:
 - Stapling mailbox rear cover. See [Stapling mailbox rear cover on page 334](#).
2. Remove three screws (callout 1), and then remove the stapling mailbox door (callout 2).

Figure 2-337 Remove the stapling mailbox door



Holder connector

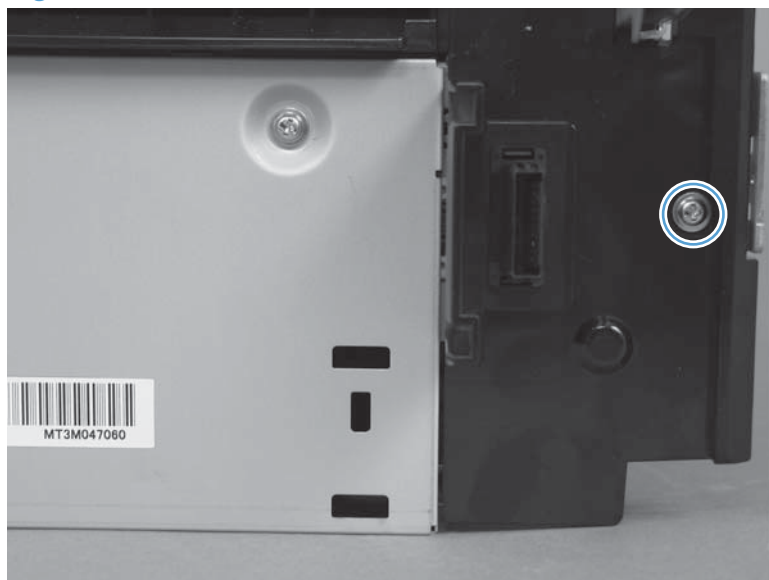
Before proceeding, remove the following components:

- Stapling mailbox rear cover. See [Stapling mailbox rear cover on page 334](#).

Remove the holder connector

- ▲ Remove one screw, and then remove the holder connector.

Figure 2-338 Remove the holder connector



Top cover

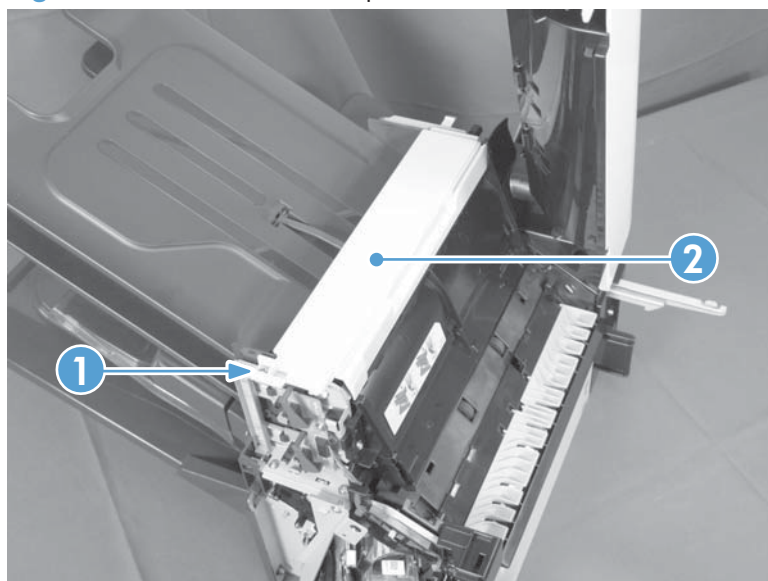
Before proceeding, remove the following components:

- Stapling mailbox front cover. See [Stapling mailbox front cover on page 333](#).
- Stapling mailbox rear cover. See [Stapling mailbox rear cover on page 334](#).

Remove the top cover

- ▲ Remove one screw (callout 1), and then remove the top cover (callout 2).

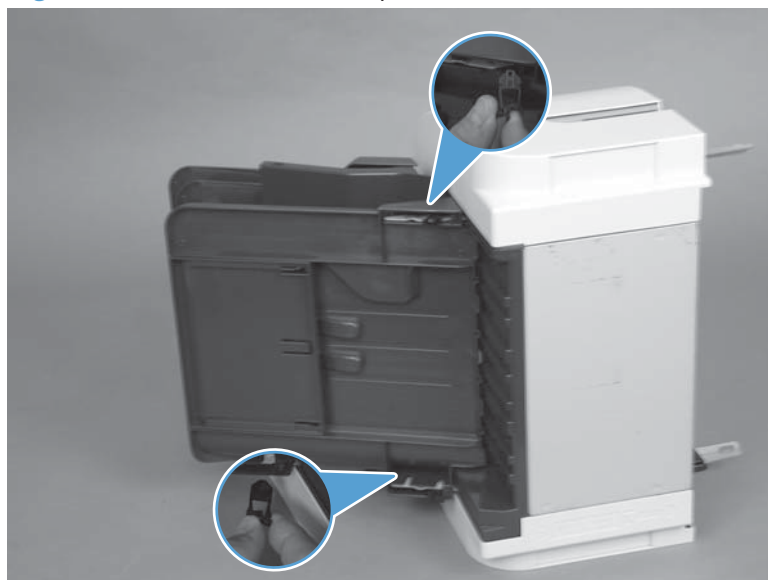
Figure 2-339 Remove the top cover



Output bin 3

1. Squeeze and pull two stoppers to remove from the output bin.

Figure 2-340 Remove the output bin (1 of 3)




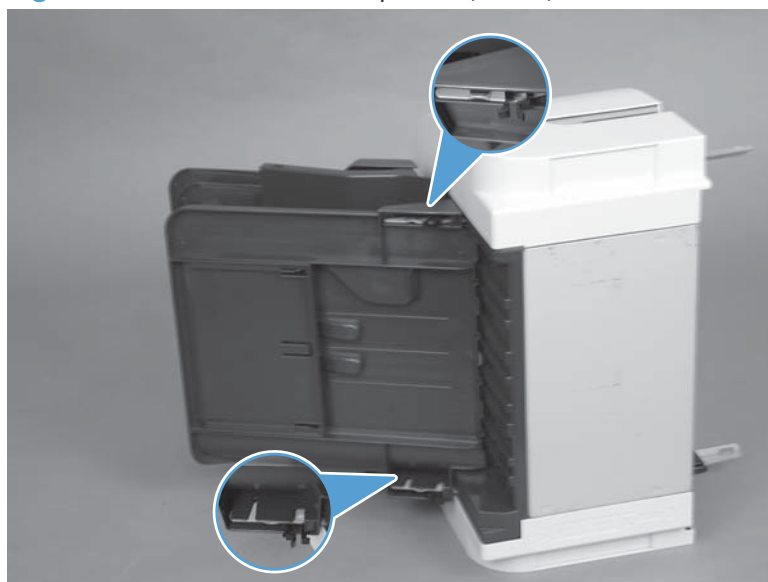
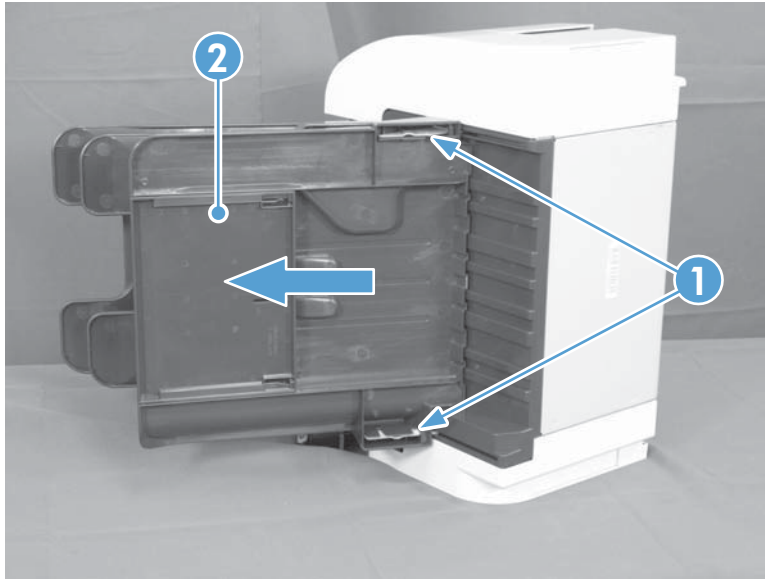
 **NOTE:** When reinstalling the output bin, make sure the two stoppers are installed in the correct position.

Figure 2-341 Remove the output bin (2 of 3)



2. Release two tabs (callout 1) and slide the output bin (callout 2) to remove.

Figure 2-342 Remove the output bin (3 of 3)



Stapling mailbox PCA

 **CAUTION:**  ESD-sensitive part.

1. Remove two screws.

Figure 2-343 Remove the stapling mailbox PCA (1 of 5)



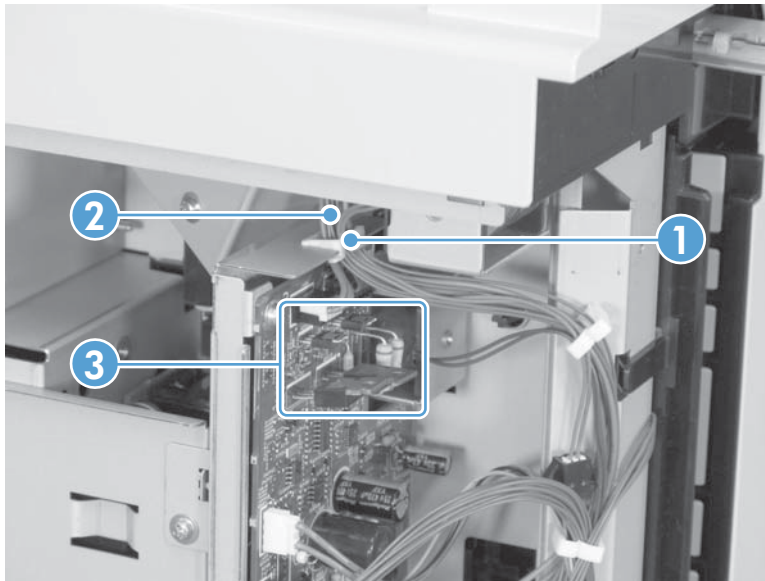
2. Remove the PCA cover.

Figure 2-344 Remove the stapling mailbox PCA (2 of 5)



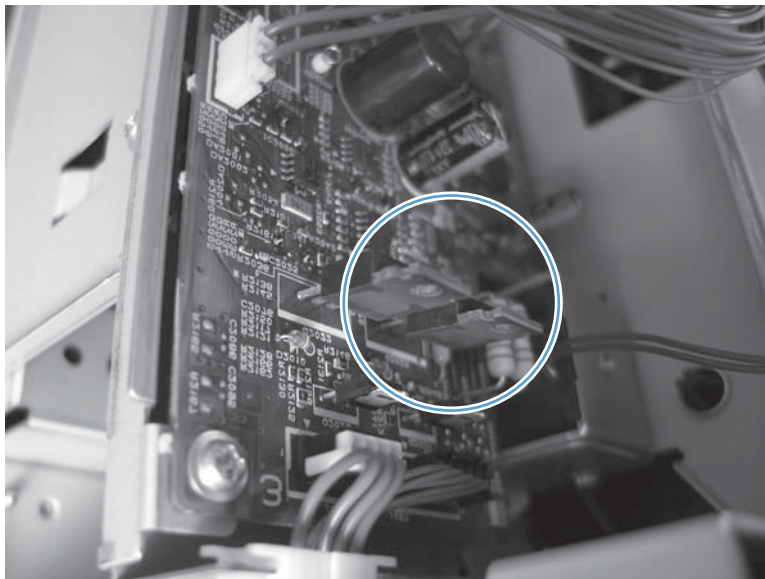
3. Release the cables (callout 2) from the cable guide (callout 1).

Figure 2-345 Remove the stapling mailbox PCA (3 of 5)



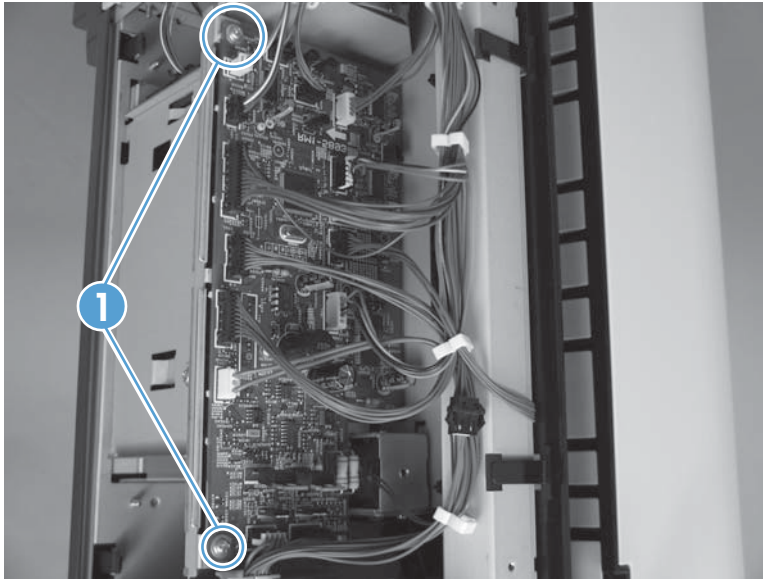
 **NOTE:** Be careful not to damage components (callout 3) on the PCA.


Figure 2-346 Remove the stapling mailbox PCA (4 of 5)



4. Remove two screws (callout 1), disconnect all connectors from the PCA, and then remove the PCA.

Figure 2-347 Remove the stapling mailbox PCA (5 of 5)



 **NOTE:** There is no connection for J460.

Stapler assembly

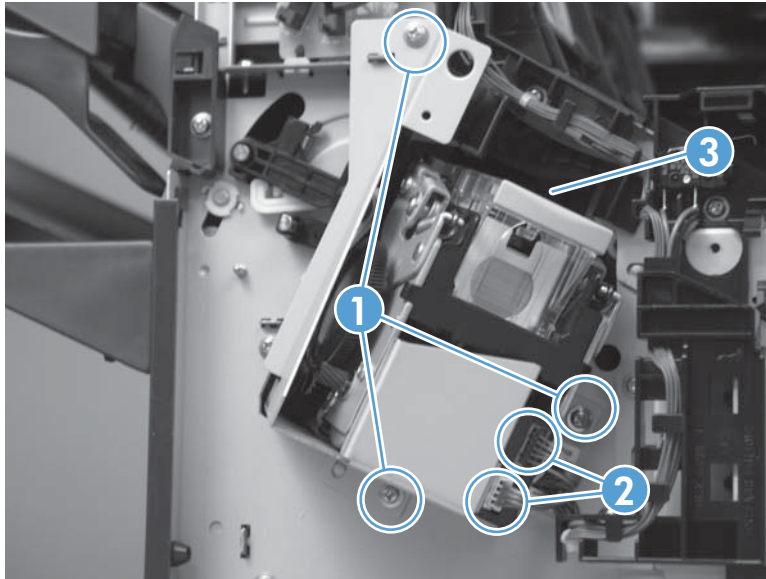
Before proceeding, remove the following components:

- Stapling mailbox front cover. See [Stapling mailbox front cover on page 333](#).

Remove the stapler assembly

- ▲ Remove three screws (callout 1), disconnect two connectors (callout 2), and then remove the stapler assembly (callout 3).

Figure 2-348 Remove the stapler assembly



Stamp solenoid

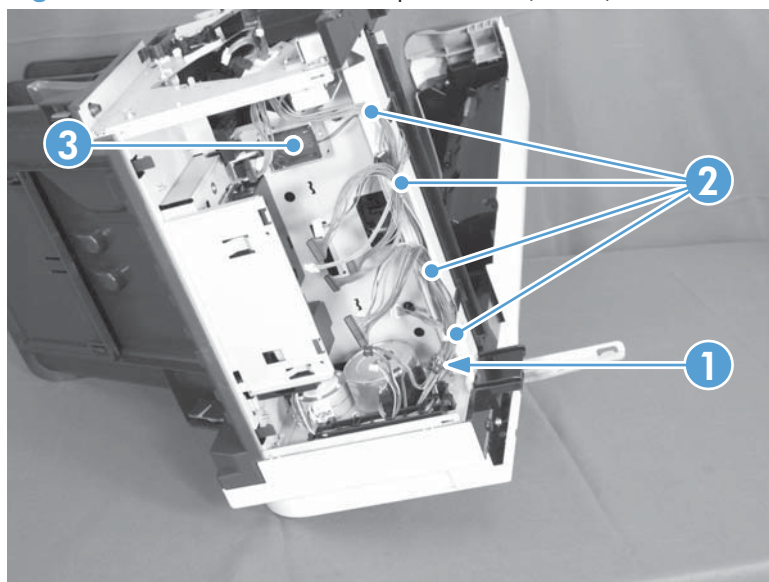
Before proceeding, remove the following components:

- Stapling mailbox front cover. See [Stapling mailbox front cover on page 333](#).
- Stapling mailbox PCA. See [Stapling mailbox PCA on page 340](#).
- Stapler assembly. See [Stapler assembly on page 343](#).

Remove the stamp solenoid

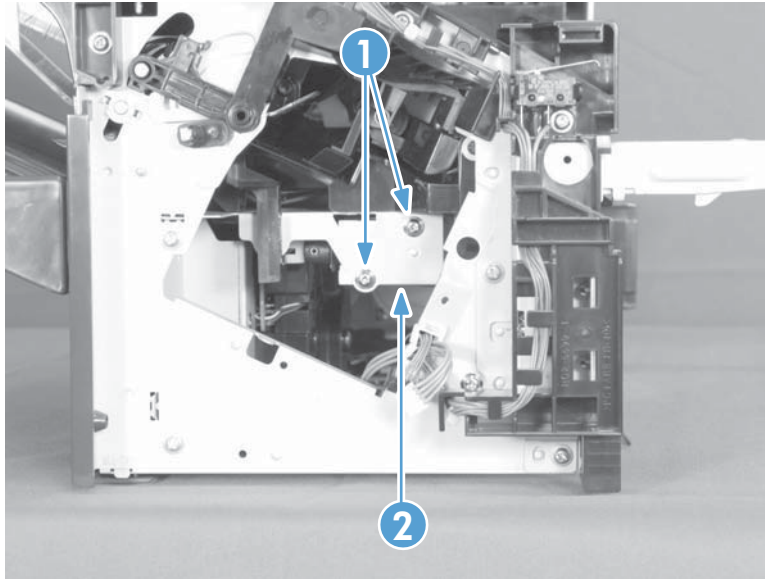
1. Disconnect one connector (callout 1), and then release the cables (callout 3) from the cable guides (callout 2).

Figure 2-349 Remove the stamp solenoid (1 of 2)



2. Remove two screws (callout 1), and then remove the stamp solenoid (callout 2).

Figure 2-350 Remove the stamp solenoid (2 of 2)



Output bin sensor PCA

Before proceeding, remove the following components:

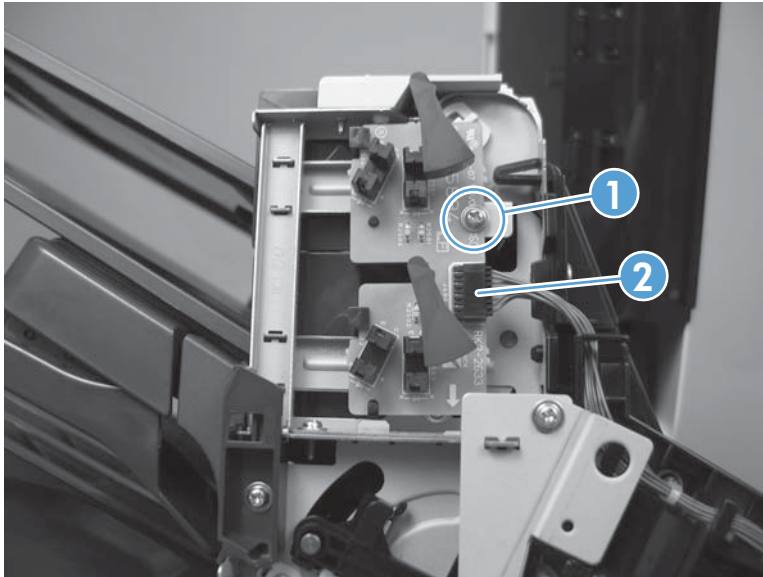
- Stapling mailbox front cover. See [Stapling mailbox front cover on page 333](#).

Remove the output bin sensor PCA

CAUTION:  ESD-sensitive part.

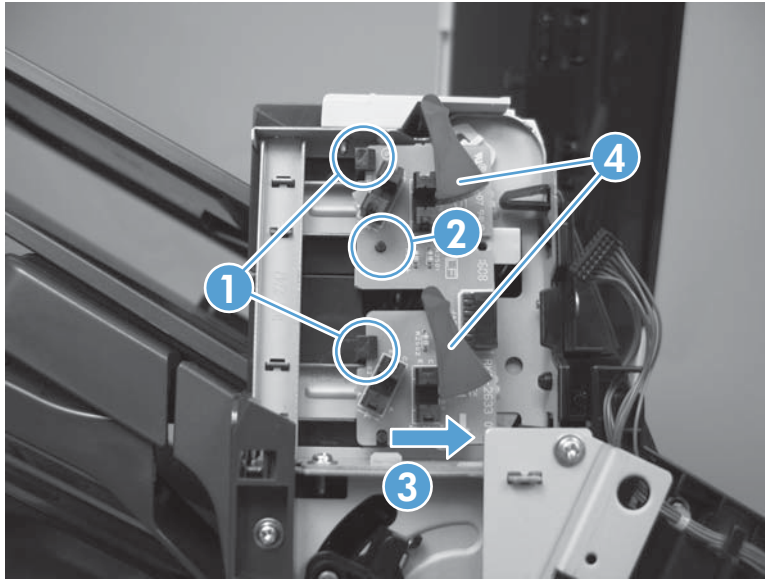
1. Remove one screw (callout 1) and disconnect one connector (callout 2).

Figure 2-351 Remove the output bin sensor PCA (1 of 2)



2. Release two tabs (callout 1), clear one post (callout 2), and slide the PCA to remove (callout 3).

Figure 2-352 Remove the output bin sensor PCA (2 of 2)



CAUTION: Be careful not to damage the flags (callout 4) when removing and installing the PCA.

TIP: When reinstalling, make sure the PCA is seated correctly with the tabs (callout 1) and post (callout 2).

Stacking panel

Before proceeding, remove the following components:

- Stapling mailbox front cover. See [Stapling mailbox front cover on page 333](#).
- Stapling mailbox rear cover. See [Stapling mailbox rear cover on page 334](#).
- Output bin 3. See [Output bin 3 on page 338](#).

Remove the stacking panel

1. Remove two screws

Figure 2-353 Remove the output bin 3 drive assembly (1 of 3)



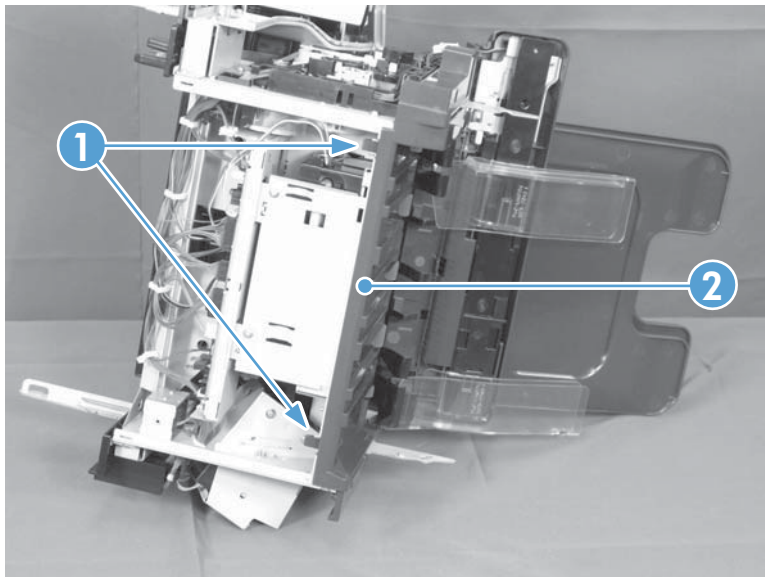
2. Remove the PCA cover.

Figure 2-354 Remove the output bin 3 drive assembly (2 of 3)



3. Release two tabs (callout 1) and then remove the stacking panel (callout 2).

Figure 2-355 Remove the output bin 3 drive assembly (3 of 3)



Jogger assembly

Before proceeding, remove the following components:

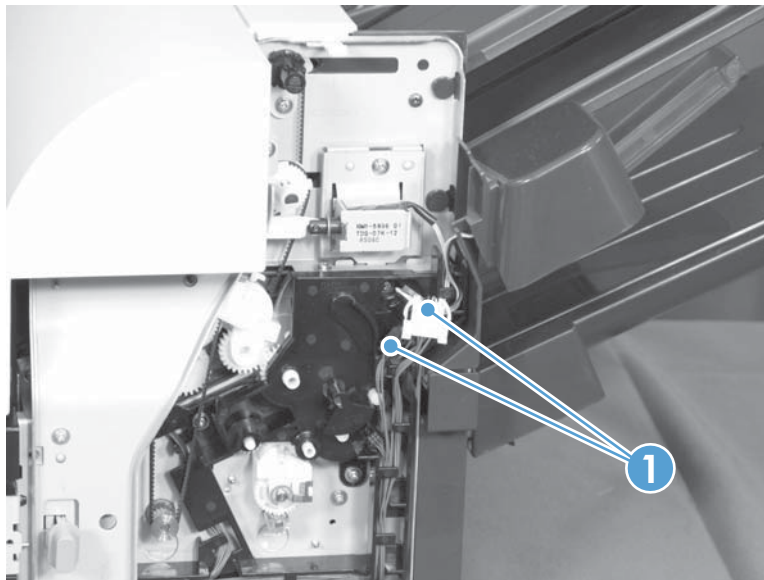
Before proceeding, remove the following components:

- Stapling mailbox front cover. See [Stapling mailbox front cover on page 333](#).
- Stapling mailbox rear cover. See [Stapling mailbox rear cover on page 334](#).

Remove the jogger assembly

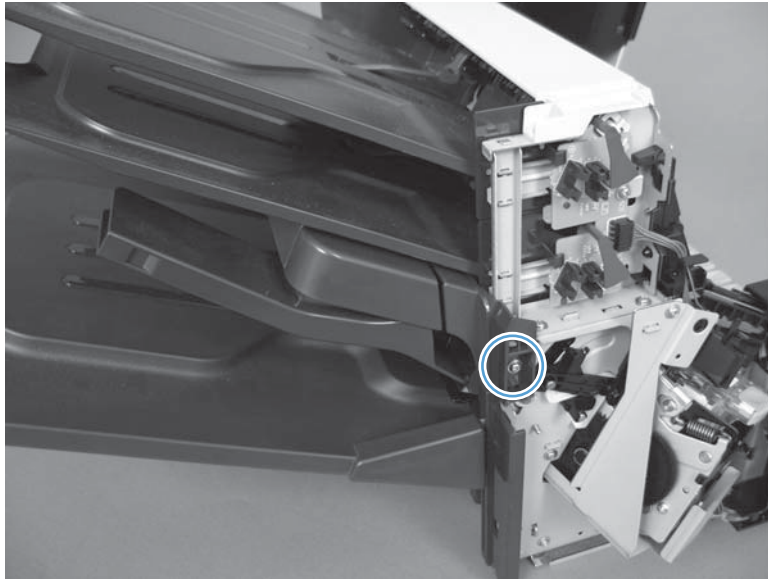
1. Disconnect two connectors (callout 1).

Figure 2-356 Remove the jogger assembly (1 of 3)



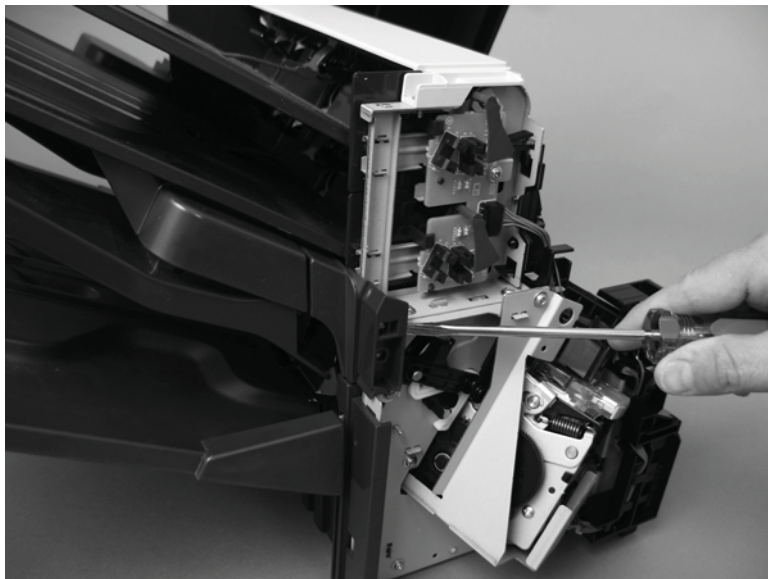
2. Remove one screw.

Figure 2-357 Remove the jogger assembly (2 of 3)



3. Disengage pin and remove the jogger assembly.

Figure 2-358 Remove the jogger assembly (3 of 3)



Flapper guide assembly

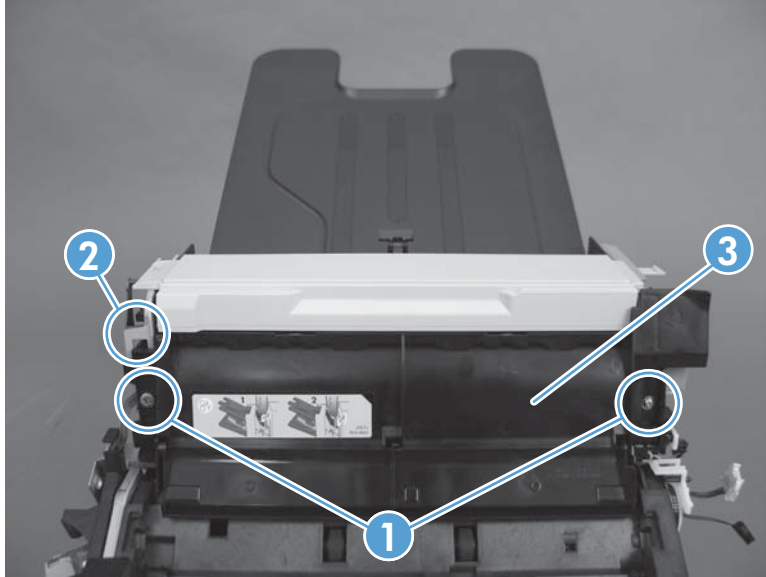
Before proceeding, remove the following components:

- Stapling mailbox front cover. See [Stapling mailbox front cover on page 333](#).
- Stapling mailbox rear cover. See [Stapling mailbox rear cover on page 334](#).
- Stapling mailbox door. See [Stapling mailbox door on page 335](#).
- Top cover. See [Top cover on page 337](#).
- Logger assembly. See [Logger assembly on page 350](#).

Remove the flapper guide assembly

- ▲ Remove two screws (callout 1), release one tab (callout 2), and then remove the flapper guide assembly (callout 3).

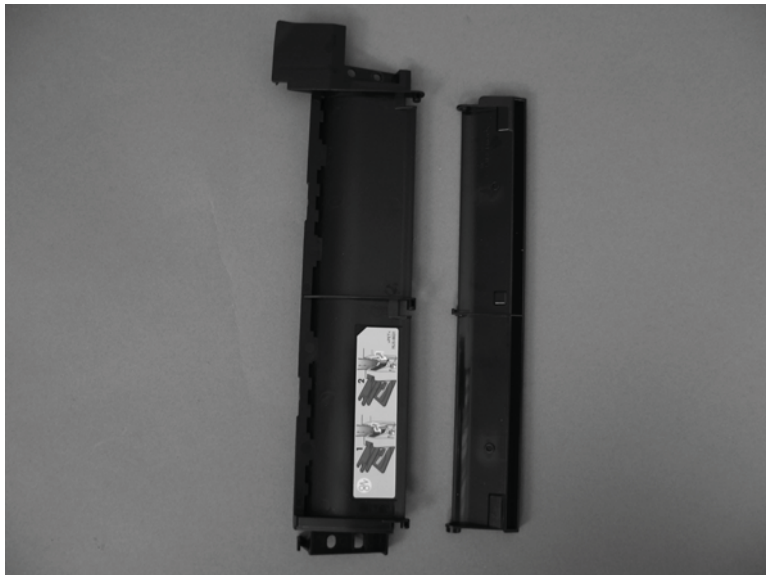
Figure 2-359 Remove the flapper guide assembly (1 of 2)



NOTE: Make sure to reinstall the stepped screw on the left side of the assembly.

NOTE: When reinstalling the assembly, make sure to correctly reattach the two pieces of the assembly.

Figure 2-360 Remove the flapper guide assembly (2 of 2)



Flapper assembly

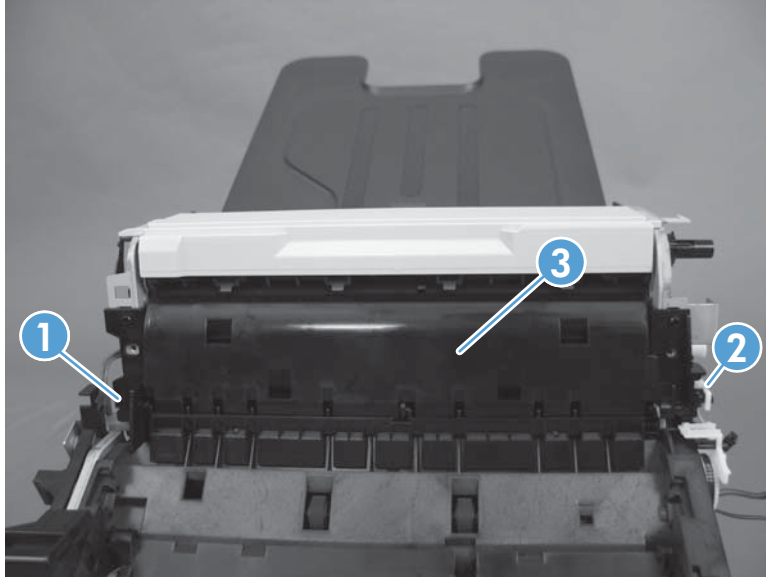
Before proceeding, remove the following components:

- Stapling mailbox front cover. See [Stapling mailbox front cover on page 333](#).
- Stapling mailbox rear cover. See [Stapling mailbox rear cover on page 334](#).
- Stapling mailbox door. See [Stapling mailbox door on page 335](#).
- Top cover. See [Top cover on page 337](#).
- Logger assembly. See [Logger assembly on page 350](#).
- Flapper guide assembly. See [Flapper guide assembly on page 352](#).

Remove the flapper assembly

- ▲ Remove one tab (callout 1), release the solenoid arm (callout 2), and then remove the flapper assembly (callout 3).

Figure 2-361 Remove the flapper guide assembly (1 of 2)



 **NOTE:** When reinstalling the assembly, make sure to correctly reattach the solenoid and arm.

Figure 2-362 Remove the flapper guide assembly (2 of 2)



MBM output bin assembly

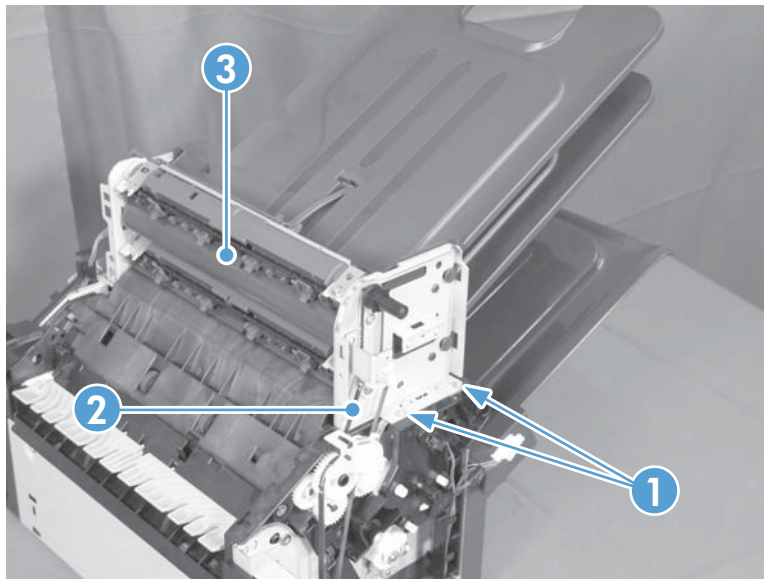
Before proceeding, remove the following components:

- Stapling mailbox rear cover. See [Stapling mailbox rear cover on page 334](#).
- Stapling mailbox door. See [Stapling mailbox door on page 335](#).
- Top cover. See [Top cover on page 337](#).
- Output bin sensor PCA. See [Output bin sensor PCA on page 346](#).
- Jogger assembly. See [Jogger assembly on page 350](#).
- Flapper guide assembly. See [Flapper guide assembly on page 352](#).
- Flapper guide assembly. See [Flapper assembly on page 354](#).
- Solenoid. See [Output bin solenoid on page 361](#).

Remove the MBM output bin assembly

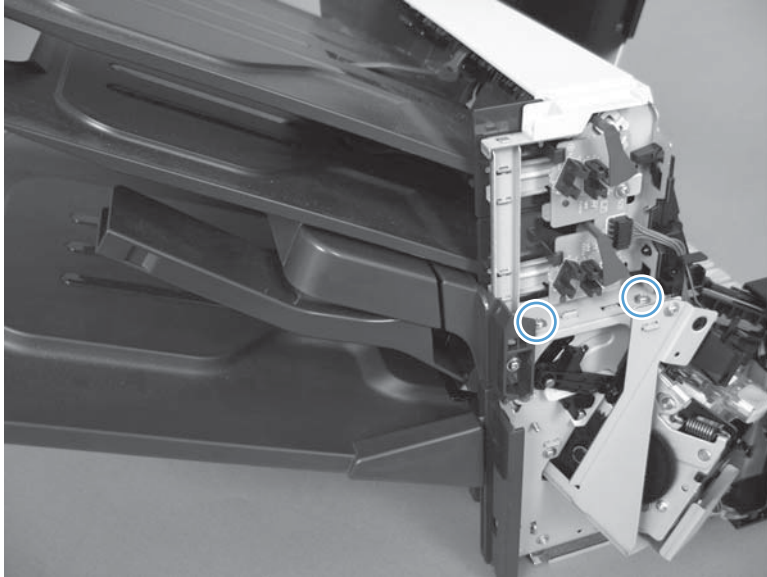
1. Remove two screws (callout 1).

Figure 2-363 Remove the MBM output bin assembly (1 of 3)



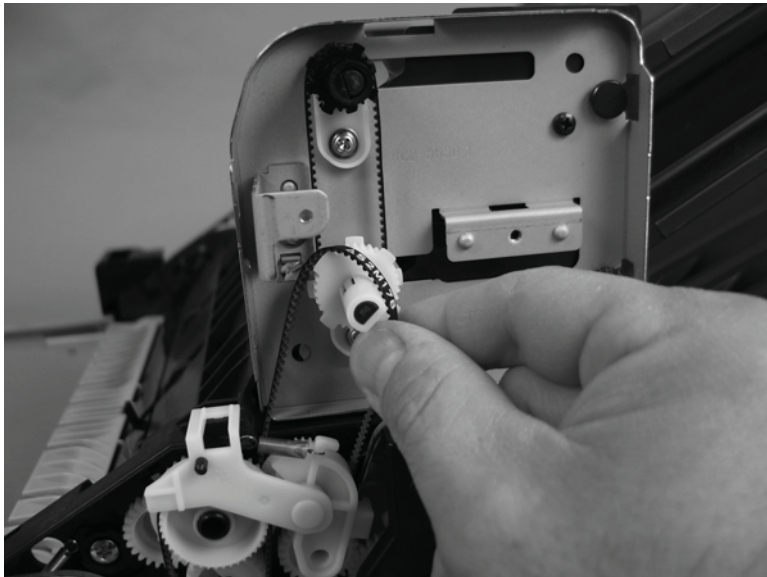
2. Remove two screws.

Figure 2-364 Remove the MBM output bin assembly (2 of 3)



3. Remove the belt and then the assembly.

Figure 2-365 Remove the MBM output bin assembly (3 of 3)



Output bin 3 drive assembly

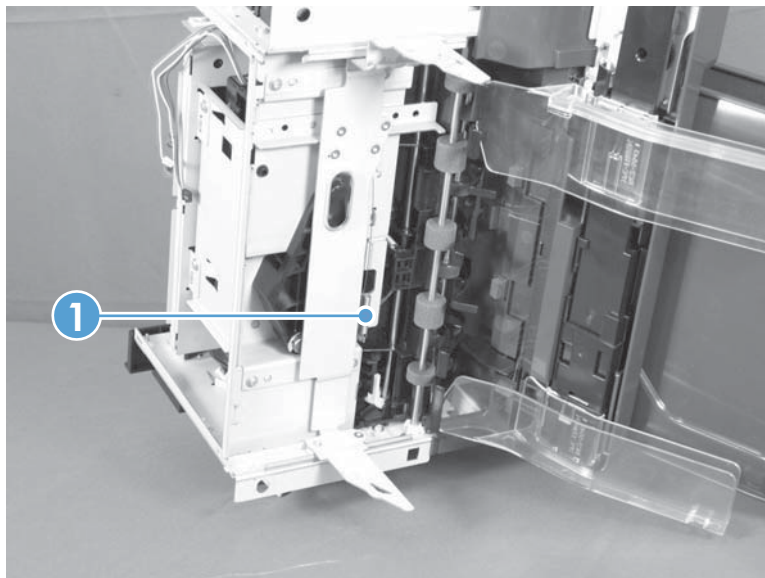
Before proceeding, remove the following components:


- Stapling mailbox front cover. See [Stapling mailbox front cover on page 333](#).
- Stapling mailbox rear cover. See [Stapling mailbox rear cover on page 334](#).
- Output bin 3. See [Output bin 3 on page 338](#).
- Stacking panel. See [Stacking panel on page 348](#).

Remove the output bin drive assembly

1. Release one spring (callout 1).

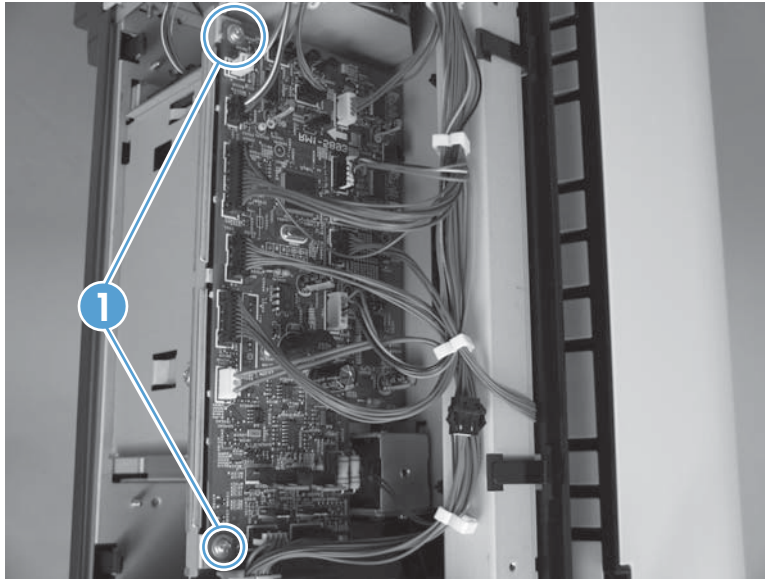
Figure 2-366 Remove the output bin 3 drive assembly (1 of 4)



 **NOTE:** If you cannot reach the spring, lower the tray support until you have clearance as shown in the next step.

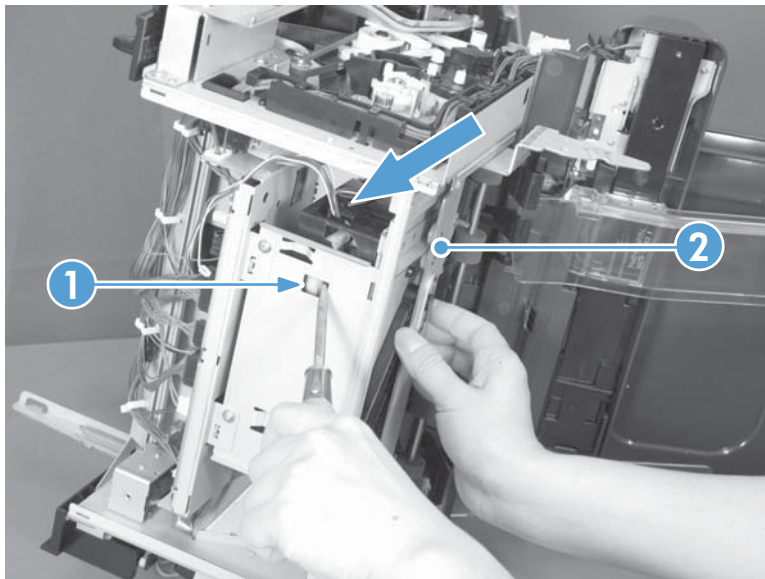
2. Disconnect two connectors.

Figure 2-367 Remove the output bin 3 drive assembly (2 of 4)



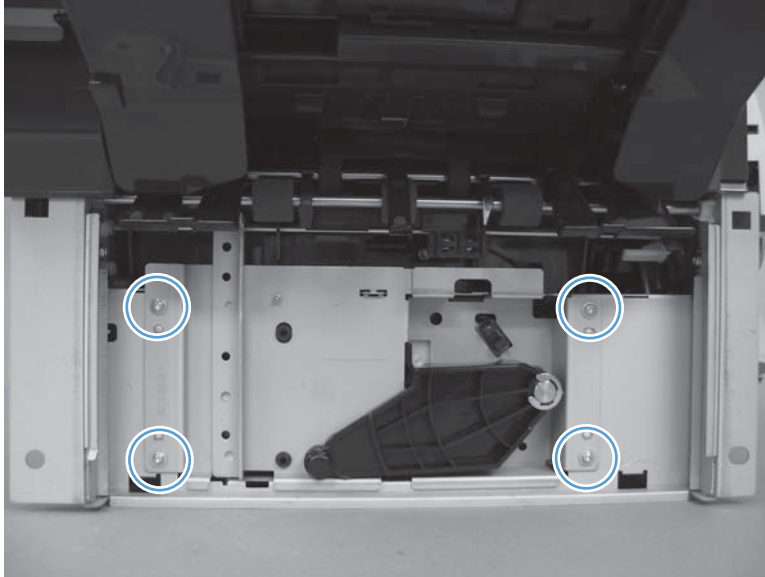
3. Using a screwdriver to disengage the gear (callout 1) and then slide the tray support (callout 2) to remove it.

Figure 2-368 Remove the output bin 3 drive assembly (3 of 4)



4. Remove four screws and then remove the output bin 3 drive assembly.

Figure 2-369 Remove the output bin 3 drive assembly (4 of 4)



Output bin solenoid

Before proceeding, remove the following components:

- Stapling mailbox rear cover. See [Stapling mailbox rear cover on page 334](#).

Remove the output bin solenoid

- ▲ Disconnect one connector (callout 1), remove one screw (callout 2), disconnect the solenoid arm (callout 3), and then remove the solenoid (callout 4) and bracket (callout 5).

Figure 2-370 Remove the output bin solenoid

